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MILITARY AFFAIRS

AVIATION AND COSMONAUTICS

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31 January 1984

USSR REPORT MILITARY AFFAIRS

AVIATION AND COSMONAUTICS

No. 11, November 1983

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal AVIATSIYA I KOSMONAVTIKA published in Moscow.

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YEFIMOV OCTOBER REVOLUTION ANNIVERSARY ARTICLE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 1-3

[Article by twice Hero of the Soviet Union Mar Avn A. Yefimov, first deputy commander in chief of the Air Forces, deputy to the USSR Supreme Soviet: "Unfading Light of October"]

[Text] The people of the Soviet Union and all progressive mankind throughout the world are joyously celebrating the 66th anniversary of the Great October Socialist Revolution, which opened up for the peoples of the world a road to constructive building, happiness, and social advance, which pointed out to the toilers a road to a new life and liberation from capitalist violence and oppression. Therefore the Great October Revolution and the victorious proletarian banner it raised -- the banner of a new era -- are so close and dear to all upright people throughout the world. The Great October Socialist Revolution unfettered the mighty forces of social advance and became an inspiring example for the working people of all countries, who are waging a selfless and difficult struggle for liberation from the yoke of capital and for their vital rights.

The peoples of former outlying ethnic regions, who had in the past been doomed to centuries of backwardness, confidently took their place alongside the working people of Russia and proceeded to stride toward a socialist future. Within a short period of time all Soviet republics achieved significant heights of socioeconomic progress.

Genuine socialism, which constitutes a new type of social progress, is inseparably linked in its present successes with the name of the founder of the Communist Party and Soviet State, Vladimir Il'ich Lenin. A faithful follower to the founders of scientific communism, K. Marx and F. Engels, V. I. Lenin comprehensively developed Marxism and led the world revolutionary process, which was gathering strength. He looked so far into the future and devised such a powerful ideological and organizational weapon for the struggle to build a new world that both today and in the foreseeable future it will continue faithfully and dependably serving the international worker class in carrying out its world-historic mission.

The most important result of the Great October Revolution and of the entire world revolutionary process has been the building of a developed socialist

society in the USSR, establishment of a new, progressive system in other countries, establishment and consolidation of a world socialist system. Today there is no country or group of countries, no ideological or political movement which has not to one degree or another felt the influence of the Great October Revolution, the influence of socialism. Such is the reality of our age. The life-giving rays of the October Revolution, the light of Leninist truth, have penetrated to the most distant corners of our planet. The disgraceful colonial system has disintegrated under the mighty pressure of the national liberation struggle of peoples. The inspiring example of the USSR and the nations of the socialist community, their experience and support have helped many young nations choose a path of noncapitalist development and socialist orientation.

But the birth of a new life does not come easily. It demands of its creators the greatest self-sacrifice and a high degree of organization, great courage and faithfulness to the chosen path. It is a difficult path, and for that reason the achievements of the socialist society are more significant and stand up in higher relief, and the more majestic are the accomplishments of its builders and defenders.

The experience of our country has convincingly demonstrated the viability of the fundamental Leninist thesis that only the worker class, led by the Communist Party, is capable of guiding the masses in the struggle to overthrow the yoke of capital and to emerge victorious in this struggle.

A great many stern trials have fallen to the lot of our people during the 60 years of Soviet rule. Under the guidance of the mighty Leninist party, however, in the most difficult years of civil war our people defended the achievements of the revolution and Soviet rule, against which the reactionary forces of domestic counterrevolution and foreign intervention had taken up arms. Born in the flame of the October Revolution, the young Red Army, armed with its revolutionary ideas, crushed the White Guard and foreign interventionist hordes, covering their fighting colors with unfading glory.

Having victoriously concluded the civil war, our country commenced peacetime construction. Following Lenin's plans and under the guidance of the Communist Party, the Soviet Union successfully and rapidly accomplished radical socio-economic transformations: industrialization, collectivization, cultural revolution, resolved the nationalities question in a fair and just manner, and within a comparatively short period of time transformed our homeland into a mighty and prospering socialist state. Creation of the Union of Soviet Socialist Republics constituted a triumph of the ideas of proletarian internationalism.

But world reaction was nurturing new, monstrous plans to destroy the USSR. It was precisely imperialism which was the source of and guilty party in the eruption of World War II, the most devastating war in the history of mankind.

The treacherous attack on the USSR by fascist Germany interrupted the peaceful labor of the Soviet people. In the Great Patriotic War, the longest and most difficult war in the chronicle of our homeland, the multiethnic socialist family accomplished a magnificent deed, unparalleled in history.

The Communist Party was a genuine and gifted organizer of the struggle by the peoples of the USSR against the invaders. It enjoyed the boundless confidence and total support of all Soviet citizens. Firmly following the Leninist thesis on the necessity of unity of political, economic, and military leadership, on the inseparable unity between battlefield and home front, the party succeeded in solidly uniting the people, in mobilizing all our country's resources to defeat the fascist hordes, and in transforming it into a united military camp. During this difficult period of trial, Communist Party policy and strategy were grounded on comprehensive consideration and skilled utilization of the laws of warfare, the objective and subjective factors which determine the fate of engagements and battles.

The Soviet Air Forces also made a worthy contribution toward victory over fascism. In spite of the great difficulties of the initial period of the war, our aviators succeeded not only in withstanding the sneak attack by elite fascist Luftwaffe wings but also in maintaining capability to engage in aggressive combat operations to defeat the hated foe. Soviet fliers, following the revolutionary and fighting traditions of the Red military pilots, boldly joined battle with the greatly outnumbering enemy forces, willingly shedding their blood and giving their very lives for victory. In the Battle of Moscow, for example, they flew 5-6 and more combat sorties per day apiece and inflicted on the enemy heavy losses in men and equipment.

Under the direction of Headquarters, Supreme High Command, a battle for air supremacy, gigantic in scale, with the aim of successful accomplishment of strategic operations and bringing the war as a whole to a conclusion, was fought in the Battle of Moscow and Stalingrad, in the battles of the Caucasus, on the Kuban, and at Kursk. By 1943, thanks to the selfless efforts of the Soviet people, our Air Forces received first-class aircraft, which in performance characteristics and armament were superior to fascist Germany's aircraft.

As a result of the savage engagements and battles on the Kursk Salient, unprecedented in scale and intensity, the 40th anniversary of which was marked this year, the strategic initiative was wrested from the enemy once and for all. With the gaining of air superiority, favorable conditions were created for our ground forces and navy to mount large strategic operations by groups of fronts, and the Air Forces were able to accomplish more determined massing of forces and to deliver strikes on the enemy in the form of an air offensive. The force of Soviet air attacks was increasing year by year. From 200 to 500 aircraft took part in each of the operations in 1941, as many as several thousand in the operations of 1943-45, and approximately 7,500 aircraft participated in the Battle of Berlin.

Soviet aviators displayed fearlessness and courage fighting for the freedom and independence of the homeland, showed a high degree of combat skill, and demonstrated by their military exploits total dedication to the great cause of the party and people. The homeland greatly appreciated their combat deeds. More than 200,000 aviators were awarded medals and decorations for successful accomplishment of missions assigned by command authorities and for courage and valor displayed thereby, while 2,420 were awarded the title Hero of the Soviet Union, 65 persons were twice awarded this title, and famed aerial aces

A. Pokryshkin and I. Kozhedub were thrice awarded this honor. USSR decorations were awarded to 897 combined units and units, 708 were awarded honorary designations, and 228 were honored with the guards appellation.

A most important role in mobilizing Air Forces personnel to defeat the fascist invaders was played by purposeful party-political work, aimed at indoctrinating aviators in the revolutionary, labor and combat traditions of the Communist Party, our people, and its Armed Forces. It exerted enormous influence on people's consciousness and feelings.

Air Forces commanders and political workers educated genuine patriot-internationalists, instilled in them a burning hatred toward the enemy, and through personal example inspired our winged defenders to perform combat exploits for the sake of freedom of the socialist homeland.

In the postwar period our country rapidly healed the deep wounds of the war and achieved new and outstanding successes in the economy, science and culture. The Soviet people were forced to accomplish these complex tasks in a difficult international situation connected with the aggressive aspirations of the United States and the other imperialist countries.

Today as well the achievements and growth in the prestige and respect enjoyed by the USSR and the entire socialist community, the successes achieved by the forces of peace, democracy and social progress are clearly not to the liking of reactionary imperialist circles. Hiding behind lying myths about a "Soviet military threat" and "Soviet military superiority," the United States and the other capitalist countries, contrary to the will of their peoples, are undertaking persistent attempts to tip the present military-strategic balance in their own favor. Once again, just as in the 1950's, they are attempting to address us from a "position of strength" and to blackmail the USSR and its allies with a hitherto unprecedented escalation of the arms race and aggressive preparations for a nuclear missile war.

In these conditions the party Central Committee, the CPSU Central Committee Politburo, and the Soviet Government, displaying enormous self-restraint and extreme wisdom, are realistically and intelligently approaching an evaluation of the complex current international situation and are engaged in tireless efforts to strengthen peace. These efforts are winning the support and approval of the broadest segments of the world community, because they are in conformity with the provisions of the Lenin Peace Decree, proclaimed on the day following the victory of the Great October Socialist Revolution.

The results of the June (1983) CPSU Central Committee Plenum, the 8th Session of the USSR Supreme Soviet, 10th Convocation, and the address at the Plenum by CPSU Central Committee General Secretary Yu. V. Andropov once again clearly demonstrated that preservation of peace on earth, both today and in the foreseeable future, is the mainline direction of USSR foreign policy. "Our goal," stressed Comrade Yu. V. Andropov, "is not merely to prevent wars. We seek a radical improvement and normalization of international relations, consolidation and development of all positive initiatives in these relations."

Everybody is familiar with specific foreign-policy actions by the Soviet Union in the area of holding the arms race in check. This year our country presented a new peace initiative, which is of enormous importance for restraining the nuclear missile arms race. The Soviet Government presented a proposal to the governments of the United States, Britain, France, and the PRC that all nuclear powers, particularly the United States and the Soviet Union, freeze nuclear arms in their possession effective 1 January 1984, both quantitatively and qualitatively. Only the future will tell how the above-named countries will respond to this peace-seeking Soviet initiative. The governments of a number of Western countries, however, which follow the lead of the United States in its dangerous course of foreign policy are presently engaged in feverish efforts to build up their military might and are attempting to secure unilateral disarmament of the USSR and to gain superiority over it.

U.S. militarist circles assign a particular role in their plans to strategic arms. The Reagan Administration is pursuing far-reaching objectives in developing U.S. nuclear potential. First of all it is viewed as the principal means which, the U.S. ruling elite believes, can help achieve a resolution by force to the historic contest between socialism and imperialism. Nuclear weapons are assigned the role of direct instrument of political blackmail against the socialist countries. High hopes are being placed on the strategic arms race upon which imperialism has embarked, out of purely economic considerations as well: creation of additional difficulties for the economy of the Soviet Union and the other socialist countries. Imperialism is endeavoring to force them to redistribute their resources to an ever increasing degree in the domain of military production. Aggressive U.S. and NATO circles are advancing this task for the sake of that same strategic objective -- to undermine socialism as a socio-political, governmental, and ideological system.

In connection with this, no-holds-barred "psychological warfare" is being waged on an unprecedented scale against the Soviet Union and the socialist countries. Proceeding to the detriment of the cause of peace is a process of all-out build-up of the offensive combat power of U.S. armed forces and a sharp increase in U.S. first-strike capability. Aggressive preparations to deploy new intercontinental ballistic missiles and cruise missiles continue. A number of projects are in progress to improve the submarine-launched nuclear missile system and to develop new mass destruction weapons.

These aggressive actions by reactionary imperialist forces, which present a danger to peace, force the Soviet Union and the nations of the socialist community continuously to strengthen their own defense, to display the highest degree of vigilance, to be on their guard, and tirelessly to concern themselves with increasing the defense might and combat readiness of the Soviet Armed Forces.

V. I. Lenin always considered military policy within the context of overall party policy. Its strength and viability have withstood the test of time and consist in the fact that it is grounded on the solid foundation of Marxism-Leninism, on Leninist teaching on war and the army, and on defense of the socialist homeland. And our party and the Soviet people are unwaveringly carrying out this Leninist behest.

Scientific formulation of the military doctrine of the Soviet State, comprehensive substantiation and practical implementation of the principles of Armed Forces organizational development, training and indoctrination of personnel, logistic support of Army, Air Forces, and Navy, training of military cadres, development of military science and art of warfare, moral-political and psychological preparation of military personnel and the entire civilian population resolutely to crush the imperialist aggressors if they dare to disrupt the peaceful, constructive labor of our people constitute the main directions of CPSU policy in the area of defense.

This is why matters pertaining to development and improvement of our Armed Forces occupy a central position in CPSU military policy. As we know, the Soviet Armed Forces were established to defend the cause of the Great October Revolution, socialist achievements, the sovereignty and territorial integrity of our nation, and the peaceful labor of the Soviet people. Hence their main function -- reliably to defend the socialist homeland and to maintain a continuous state of combat readiness.

The Soviet Air Forces, together with the other USSR uniformed services, play an important role in accomplishing these difficult and critical missions in present-day conditions. They have advanced today to a qualitatively new level and are equipped with modern weapons and other hardware. The result is increased mobility and maneuverability, a higher level of proficiency of Air Forces personnel, an increased number of excellent-rated units and subunits, a swelling of the ranks of honored military pilots USSR and honored military navigators USSR, and a greater number of subunits with a high proficiency rating.

At the "Soyuz-83" [Alliance-83] exercise held this summer, aviation personnel displayed a high level of proficiency, skilled mastery of combat equipment and weapons, and total dedication to the fine ideals of the October Revolution and the behests of Lenin. The military labor of our leading aviators was duly honored by the homeland. A large number of Air Forces personnel were awarded government decorations for successes in combat and political training in honor of the 60th anniversary of establishment of the USSR.

An important role in accomplishment of the missions assigned to the Air Forces was played by socialist competition, conducted under the slogan "Increase Vigilance and Reliably Ensure the Security of the Homeland!" Substantial success in improving professional expertise and increasing combat readiness was achieved by socialist competition leaders in the Air Forces -- the units and subunits in which officers V. Vorob'yev, V. Ivanov, A. Pavlenko, V. Rebrov, V. Kraskovskiy, and others are commanders and political workers. That which they have achieved is first and foremost a result of tireless efforts and innovative quest by pilots and navigators as well as all Air Forces aviation specialists.

The anniversary of the October Revolution is an important landmark in the lives of Air Forces units and subunits and in the life of each and every serviceman. Aviation personnel report to the homeland on completion of the training year and successes achieved in improving combat proficiency, as well as on further increase in combat readiness in light of the demands of the 26th CPSU Congress,

the November (1982) and June (1983) CPSU Central Committee plenums, in conformity with the points and conclusions contained in the speeches of CPSU Central Committee General Secretary Comrade Yu. V. Andropov.

Aviation personnel, just as all armed defenders of the homeland, unanimously support CPSU domestic and foreign policy, the party's policy of intensification of production, boosting the material prosperity and cultural level of Soviet citizens, further development of socialist democracy, strengthening of the Soviet way of life, preservation of peace, and prevention of thermonuclear war. They are responding with specific deeds to the party's appeal for an all-out effort to strengthen discipline and order, are working persistently to improve their level of air, weapon, and tactical proficiency, and are working to master the combat equipment entrusted to them.

In order to achieve new levels of performance in the forthcoming training year it is necessary to make effective use of the time remaining, in order to improve training facilities and to equip all officers with advanced techniques of training and indoctrinating personnel. It is essential to analyze deeply and comprehensively errors and mistakes which have occurred in certain units and subunits in organizing flight operations and in breaking in young flight personnel.

Exceptionally important work must be accomplished in this period pertaining to planning combat and political training, focusing particular attention on increasing the air, weapons, tactical, and technical proficiency of aviation personnel. It is essential thereby to proceed from the position that the degree to which plans are precise and well-conceived will determine the level of professional expertise of commanders, the rhythm of flight training, effectiveness of competition, quality of tasks being performed, and further increase in the combat readiness of Air Forces units and subunits.

It is also important to bear another thing in mind: plans should focus aviation personnel on the campaign for high quality and economy of training, economical expenditure of materiel, and for effectiveness of each and every training hour. It is essential to work persistently to ensure that all demands of guideline documents be taken into account in the process of planning, as well as recommendations brought by the meeting of party activists at the USSR Ministry of Defense, which discussed the tasks proceeding from the decisions of the June (1983) CPSU Central Committee Plenum, the 8th Session of the USSR Supreme Soviet, 10th Convocation, and the instructions of CPSU Central Committee General Secretary Comrade Yu. V. Andropov.

Military councils, commanders, political agencies, headquarters staffs, party and Komsomol organizations must concentrate their main attention on providing ideological support to the tasks of improving combat readiness, on achieving higher performance results in mastering equipment and weapons, on strengthening military discipline, and on ensuring observance of regulations and organization in Air Forces units and subunits.

It is essential to approach in a more demanding and exacting manner evaluation of the results of the military labor of aviation personnel and resolutely to eliminate all things which hinder growth in the combat proficiency of the

winged defenders of the homeland, their training and indoctrination. Right now, at the threshold of the new training year, each and every Air Forces military collective, each and every aviator must focus on achieving new performance levels in combat and political training and be deeply cognizant of his role and personal responsibility for strengthening the defense capability of the homeland, for the future of genuine socialism and life on our planet.

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IMPORTANCE OF INNOVATION, REALISM IN MOCK AIR COMBAT EMPHASIZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) p 4

[Article, published under the heading "For a High Degree of Combat Readiness," by Lt Col M. Novikov: "Lack of Imagination and Innovation Are Incompatible"]

[Text] During a tactical air exercise the pilots of the flight under the command of Capt A. Popov were assigned the mission of repulsing an "aggressor" air attack. The commander was pleased with the actions of his men. But the tactical control officers suddenly noted on the radarscope a brighter blip than those which had preceded it. This could mean a bomber. Capt A. Smirnov was scrambled to make the intercept. He executed the guidance commands with precision, and soon he radioed: "Target in sight!"

"Permission to destroy the target," the ground controller replied.

The pilot proceeded to maneuver to an attack position. In order to ensure downing the "aggressor," he decided to move closer. But suddenly the bomber (it was in fact a bomber) disappeared from the pilot's radar sight. All Smirnov's efforts to reestablish radar contact failed. He was unable to attack.

What had happened? Why did Captain Smirnov, who had performed like missions in the past, foul up on this occasion? His superiors sought to determine the reasons. It seems that a regular routine method of making an intercept in such conditions had been worked out in this officer's subunit. The target proceeds along the course, smoothly alternating in executing turns to the right and left of its basic path. They call this "maneuvering." All the interceptor has to do is precisely execute the tactical control officer's commands, and a gun-camera "kill" is assured. The fighter also "hangs" on the target's tail for a fair length of time.

Could this happen in actual combat? Of course not! The adversary is not stupid; he has also been taught how to fight. A graphic example of this is the failed intercept. The bomber pilot from the neighboring airfield acted innovatively, not by predictable routine, and logically emerged the victor, evading the attack.

Of course standard attack configurations must be rehearsed, especially by inexperienced combat pilots. A pilot's combat applications training commences with this. As practical experience indicates, however, considerable success in this kind of training is achieved in those units where combat pilots, in addition to initial practicing of routine procedures, perfect their tactical proficiency, perform subsequent missions against a complex tactical scenario background, while the pilots flying the target role employ in full measure modern air combat tactics.

Unfortunately they forget about this in some units. It is perhaps for this reason that some pilots have begun viewing one-on-one air combat as a simple task: takeoff, climbout, proceed to the target -- and success is guaranteed. No difficulties whatsoever! Just precisely execute the tactical control officer's commands and victory is yours. The command personnel who looked into the state of affairs in officer Smirnov's subunit correctly noted that this attitude to exercises of this type totally fails to meet today's demands. It is impeding growth of professional expertise and the moral-psychological development of the combat pilot. Unimaginative routine and innovativeness in flying are as incompatible as opposite poles. And it is also essential for the tactical control officer to be able to maintain contact with a maneuvering target and promptly adjust his guidance commands.

Let us return, however, to Captain Smirnov. The failed intercept of the maneuvering bomber served as a strong warning to him. Now he thoroughly prepares for such missions. He endeavors to become more familiar with the "adversary" and his tactics, he thinks through different engagement variations, and as a rule he attacks swiftly and surely. He teaches his subordinates to do likewise.

Once the officer was to fly a training mission involving pilot-controlled air combat with an experienced "aggressor," who would be fighting at optimal speeds and at high g-loads. Employing elaborate maneuvers and unexpected tactics, he would be squeezing every bit of performance out of his fighter. It would be no easy matter to defeat such an adversary. Smirnov conferred with the squadron commander and suggested several combat variations. They sat down together and discussed the possible situations; the captain diagramed maneuvers and figured maneuver timing. The squadron commander recommended that he refrain from routine, unimaginative actions right at the outset of combat, that he trick the "aggressor" by employing an unusual vertical maneuver. They calculated the rate of maneuver execution, and then "walked through" the dogfight. Smirnov practiced the new tactics in the practice area the next time he went up.

Innovative preparation preordained the outcome of the engagement. Smirnov seized the tactical advantage at the very outset. He was able to impose his own tempo on the "aggressor" and gained a clear-cut victory. At the debriefing this dogfight was studied in detail with all personnel. It provided excellent food for thought. Now the men of this subunit have begun innovatively preparing for training missions and are devoting more attention to tactics.

During the Great Patriotic War the enemy was defeated by those who were well prepared tactically, who acted with determination and initiative, who strictly observed the requirements of documents regulating flight operations, and who

innovatively made adjustments to the standard attack configurations, changes based on thorough knowledge of the combat capabilities of their own fighters and the tactics of the enemy.

Today even greater demands are imposed on waging combat. Tactical proficiency is absolutely essential to a combat pilot. Even with an excellent aircraft and formidable weapons, if a pilot does not have a mastery of the great diversity of techniques and modes of conduct of air combat, he will be unable to make use of the advantages of his aircraft and to defeat the adversary.

Of course it is no easy task to improve the tactical proficiency of pilots and to develop excellent moral-fighting qualities in them. It requires a constant and full exertion of effort, close coordination and mutual understanding with tactical control officers. A pilot should put all his capabilities into play in flying a training mission in a near-combat situation. Some, however, in their desire to receive a high mark, seeking to avoid any calculated risk, look for unnecessary situation simplification. Although rarely, it does happen that pilots sometimes agree in advance on time and place of rendezvous over the range and modes of attack to be employed. They do this for the sake of the gun-camera record, losing sight of the fact that in actual combat they will be dealing with a crafty adversary, who is well-trained and equipped with the most advanced hardware. Such oversimplification is intolerable.

As is indicated by the experience of vanguard units and subunits, the top results in combat training, in minimum time and with strict observance of documents regulating flight operations are achieved by those collectives in which on every training flight the pilots are placed into a situation which they will encounter in actual combat. In this manner they develop courage, fearlessness, determination, learn to evaluate a situation swiftly and to make correct decisions when time is of the essence.

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POLITICAL OFFICER URGES INTENSIFIED INDOCTRINATION OF AVIATION ENGINEERS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 6-7

[Article, published under the heading "Implementing the Decisions of the 26th CPSU Congress," by Lt Gen Avn A. Volkov, chief of the political department at the Order of Lenin and the October Revolution Red-Banner Air Force Engineering Academy imeni Professor N. Ye. Zhukovskiy: "The Military Engineer -- Ideological Warrior of the Party"]

[Text] "At the military educational institutions of the Ministry of Defense it is important to increase the ideological influence of the social sciences on enrolled personnel, to boost their level of knowledge in military and specialized subjects, and strictly to observe the principle of party-mindedness of instruction."

From a report presented by USSR Minister of Defense MSU D. F. Ustinov, member of the CPSU Central Committee Politburo, at a meeting of USSR Ministry of Defense party activists on 21 June 1983.

Maintenance of modern aircraft and weapons and the changes which are taking place in the character and modes of combat operations insistently demand enhancement of the role of the aviation engineer in all training and indoctrination work with Air Forces personnel. This demand is also dictated by the fact that in present-day conditions maintaining fixed-wing and rotary-wing aircraft in a continuous state of combat readiness, ensuring their efficient combat employment, and observance of flight safety rules and procedures depend entirely on smooth and well-coordinated actions by all categories of aviation personnel.

CPSU Central Committee General Secretary Comrade Yu. V. Andropov emphasized in his address at the June (1983) CPSU Central Committee Plenum: "...The party seeks to ensure that a person is educated in this country not merely as a bearer of a certain sum total of knowledge, but first and foremost as a citizen of a socialist society, an active builder of communism, with his inherent ideological principles, ethics and interests, and high standards of labor and conduct."

This also applies to Soviet officers, including military aviation engineers. Therefore our academy's command, political department, teaching faculty, party and Komsomol organizations are making every effort to ensure that academy graduates become valuable assets of our valiant Armed Forces, not only as technically sophisticated and knowledgeable organizers of aviation engineer service in the Air Forces but also, and primarily, as party ideological warriors, active participants in the ideological, mass-political work conducted in aviation units and subunits.

The academy's scientific research and instructional activities, just as those of all Soviet military higher educational institutions, are focused toward the future. The practical results of these activities, the effectiveness of the entire training and indoctrination process, its successes and deficiencies, are reflected, as in a mirror, in the daily life and combat training of the line units, in the daily labor of the large detachment of aviation engineers. For this reason, in specifying further improvement in the quality and effectiveness of the training and indoctrination process within the framework of the demands of the June (1983) CPSU Central Committee Plenum, we are closely monitoring the social activeness of our young engineers and their participation in party-political work conducted in the units, and we are studying reports on our graduates received from line units.

Here are a few facts. Engineer leader personnel presently comprise approximately 20% of officer Marxist-Leninist training group leaders and 40% of warrant officer political instructors and enlisted personnel and NCO political class instructors. One out of every three aviation engineers is a member of an agitation and propaganda group. Military aviation engineers also take active part in the work of elected party bodies. They comprise about 40% of party group organizers, 35-40% of shop party organization secretaries, and one third of secretaries of primary party organizations.

How are the demands of the June (1983) CPSU Central Committee Plenum being implemented at the academy, and what goals and tasks face academy personnel for the immediate future?

First of all we should like to stress that in concerning themselves with shaping the ideological outlook of our enrolled personnel, the academy command, political department, and teaching faculty are vigorously working to ensure that the academy becomes a center of Marxist-Leninist education of aviation engineer cadres and that the knowledge acquired at the academy forms the foundation of their political convictions. Therefore improvement in the ideological-theoretical and organizational-methods level of teaching history of the CPSU, Marxist-Leninist philosophy, political economy, scientific communism, and party-political work are the subject of special study and discussion at meetings of the academy council and in the party organizations of the faculties. Practical experience has confirmed the correctness of organizing an interdepartmental seminar on the social sciences, at which academy personnel discuss in an innovative and meaningful manner the most relevant issues pertaining to improving the teaching of Marxist-Leninist theory and Communist indoctrination of enrolled personnel.

In the process of thorough study of the writings of the founders of Marxism-Leninism, future aviation engineers learn to understand their significance as an ideological foundation for all their practical activities. We are gratified by the fact that we are today encountering growing interest by enrolled personnel in Marxist-Leninist theory, history and politics of the CPSU at the present stage of building communism. All this prompts social sciences instructors to seek new forms and methods of teaching.

An important, basic reserve potential of this question is further development in enrolled personnel of the need for independent-effort mastery of Marxist-Leninist theory. In our opinion this is the core of all work done by the social sciences departments, course directors, party organizations, and a most important condition for successful ideological-theoretical growth of future aviation engineers. We try to develop in them a constant desire to turn to the writings of K. Marx, F. Engels, and V. I. Lenin, to the writings and speeches of our party and government leaders. This entire process is scrutinized by the standing commission of the social sciences departments, which is headed by the deputy head of the department of philosophy and scientific communism, Candidate of Historical Sciences and Docent Col G. Mishurovskiy. With its recommendations and advice the commission helps faculty and students gain a more purposeful and deeper mastery of the major points of Marxist-Leninist theory, as well as an understanding of CPSU foreign and domestic policy. I can state without exaggeration that in the course of studying CPSU history, the glorious, heroic path of its development and revolutionary-transforming activities arouse in students a feeling of pride in our Leninist party and the aspiration faithfully to serve its cause.

As we know, in conditions of the scientific and technological revolution, arming officers with Marxist-Leninist methodology assumes fundamental significance in military affairs. Study of Marxist-Leninist philosophy, scientific communism, and political economy enables them to understand the essence of phenomena taking place in nature and society, to cognize the objective laws governing their development and, what is particularly important, to understand their role and function in building and defending the achievements of socialism. In turn mastery of Marxist-Leninist teaching on war and the army, the military-theoretical legacy of V. I. Lenin, and his ideas on defense of the socialist homeland enables future aviation engineers thoroughly to comprehend the great, complex and critical tasks facing the Armed Forces in conditions where the imperialist aggressors are escalating the arms race and are stepping up efforts in the ideological and psychological struggle against the USSR and the nations of the socialist community.

Recently the academy has been devoting greater attention to forming in enrolled personnel skills in the conduct of party-political work. In lectures and seminars, department faculty endeavor to reveal deeply and comprehensively such important problem items as the fundamentals of party organizational development, the forms and methods of a comprehensive approach to indoctrination, ways to transform primary party organizations into centers of daily ideological indoctrination activity, and point out the role and place of the engineer-Communist in organization of party-political work. Seminar classes play a most important role in developing in students skills in teaching and

indoctrinating subordinates; at these seminar classes officers learn the skills of the propagandist, regularly presenting reports and papers.

Practical sociopolitical activities have taken on important significance. Just what do they entail? Stated briefly, they involve an aggregate of measures directed toward forming in students the skills of a propagandist, a party ideological warrior. During their schooling, students receive skilled consultation on preparing political briefings, reports and lectures on political topics, reviews of political literature, as well as assistance in mastering legal indoctrination methodology.

There is also a good opportunity to improve teaching skills during student tour of duty in line units. Their direct participation in the activities of party and Komsomol organizations of Air Forces units and subunits, agitation and propaganda teams, presentation of lectures and reports on sociopolitical topics, consultation sessions on matters pertaining to ideological-political and military indoctrination, military education science and psychology unquestionably help develop the qualities needed by the party ideological warrior.

An important source of forming ideological conviction is publicity of the heroic road trodden by the Soviet people and their valiant Armed Forces and by the glorious Soviet military aviation. We are offered extensive opportunities for military-patriotic indoctrination of enrolled personnel by the 40th anniversary of major Soviet Army operations in the Great Patriotic War and preparations for celebrating the 40th anniversary of the victory of the Soviet people over German fascism. A great many officers and general officers who are veterans of the Great Patriotic War are presently attached to the academy. They include twice Heroes of the Soviet Union V. Popkov and G. Sivkov, Heroes of the Soviet Union G. Bayevskiy, V. Grachev, B. Levin, I. Lezzhov, and V. Sudakov. We are endeavoring more fully to utilize the wealth of experience of the war veterans. Their accounts of the courage and heroism of military aviators and the role of aviation engineers and technicians in ensuring successful combat operations by Soviet military aviation always attract the attention of enrolled personnel and leave a deep imprint in their consciousness.

In teaching and indoctrinating future aviation engineers, we endeavor to ensure a high level of party-mindedness of teaching not only the social sciences but all other subjects as well, without exception -- military, specialized and technical, and we endeavor to ensure that students gain a deep understanding of the class-political directional thrust of the development of science and military engineering activities. This is precisely the manner taken by such experienced educators as USSR Academy of Sciences Corresponding Member A. Krasovskiy, professors V. Tikhonov, A. Ganulich, A. Tarasnikov, and others. In their classes they explain to the officers that the subjects being studied in the final analysis serve a single lofty, noble aim and are closely linked with practical implementation of party domestic and foreign policy.

We should note that more attention has been devoted to party-mindedness of teaching since the 26th CPSU Congress, and particularly following the June (1983) CPSU Central Committee Plenum. In particular, this matter was repeatedly discussed at meetings of the academy council, at meetings in the political department, and was discussed at party meetings. We focused attention on the

necessity of an ideological directional thrust to engineering theses and term papers. It is no secret that in the recent past principal attention was focused only on the content of special lectures, seminars, laboratory classes, and preparation of textbooks and methodology manuals. Problems of party-mindedness of senior papers and engineering theses were addressed fairly infrequently. We must admit that even today there are instances where their authors limit themselves to statement of narrow technical problems, relying only to a minimum degree on that which we call ideological sophistication.

We discussed these matters thoroughly and comprehensively at a methods conference, at party organizations of departments and courses of study, examining them in light of demands of the party, the USSR minister of defense and commander in chief of the Air Forces. As a result the practical business of preparing and defending term and particularly senior theses and papers became considerably enriched with ideological content. For example, Engr-Majs V. Bykhovets, A. Shcherbinin, and I. Cherneyev, Maj S. Chekalin, Engr-Capt A. Skirda, Capts G. Yakimkin and V. Vasil'yev, and Sr. Lt V. Chernov displayed in defending senior and term papers a profound understanding not only of the technical engineering problems being investigated but also their increased significance for strengthening the combat potential of military aviation in conditions of increased aggressiveness of world imperialism, particularly the United States.

We have already stated that the most important criterion for evaluating the performance of the military higher educational institution is the job done by its graduates in the line units. This is why we constantly study and analyze the activities of our graduates as leaders and indoctrinators of aviation engineer service personnel. We vigorously utilize for this purpose specific field inspections to line units by academy and faculty officials, and especially teaching faculty, as well as tour of duty in units by instructor personnel. Also of considerable interest are observations made by faculty members from the social sciences departments who work each year in line units and study in detail the organizer and political indoctrination work experience of commanders, party and Komsomol organizations as well as participation by academy graduates in party-political work.

In the political department there is constant discussion of the results of inspection tours and tours of duty in line units by social scientist faculty members, with these personnel presenting reports. We note with satisfaction the steadily growing sociopolitical activeness on the part of our graduates and their participation in political indoctrination work among military aviation personnel. We also see, however, that which hinders the young aviation engineer from fully acquitting himself as an indoctrinator, an active disseminator of party policy, and an officer whose word is not at variance with his deeds.

The work experience of the academy command, the party organizations of the faculties, as well as professor and instructor personnel convinces us once again that we possess considerable reserve potential for achieving further improvement of the training and indoctrination process and for developing in

future aviation engineers the ability to be party ideological warriors and aggressive propagandists of the party's ideas. A high level of professional preparedness, sociopolitical activeness on the part of teaching faculty, as well as a deep understanding by enrolled personnel of the necessity of successfully combining work in their specialization area with continuous participation in political indoctrination work with personnel constitutes a guarantee of successful accomplishment of this important, multifaceted task. Only in this case will our Soviet military engineer cadres, in addition to a high degree of professional expertise, possess the requisite ideological conditioning, as the party requires.

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IMPORTANCE OF STRICT OBSERVANCE OF REGULATIONS HIGHLIGHTED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 8-9

[Article, published under the heading "For a High Degree of Combat Readiness," by military navigator 1st class Lt Col V. Vostretsov, aviation regiment executive officer: "To Serve as Regulations Demand"]

[Text] The squadron under the command of Maj V. Ryabov was again given an excellent rating on the basis of the year's performance results. The men of this squadron have maintained this rating for several years in a row now. The work experience and know-how of this vanguard subunit has been assimilated in the unit. One can state with confidence that one of the main reasons for success lies in firm military discipline. It is precisely discipline which ensures precision performance by the headquarters staff, organization and follow-through by personnel, and proper mutual relations among servicemen.

At the same time we should take particular note of another important factor which affects success in combat and political training -- personal example by the squadron commander, his deputies, and the commanders of the flights. As experience indicates, a leader serves as an example of performance of military duty only when he himself does his job in an exemplary manner, hews to the standards of military ethics and Communist morality, when he is demanding and responsive, regularly engages in training and indoctrination of his men, effectively campaigns for a strong, monolithic fighting team, and is capable of performing assigned tasks and missions precisely and on schedule. It is for good reason that the USSR Armed Forces Internal Service Regulations define the role of commander as follows: "He should serve for his men as an example of strict observance of moral and ethical standards of conduct and flawless execution of the requirements of Soviet laws, the military oath of allegiance, military regulations, and his job duties."

In the Air Forces the importance of the commander role model is heightened by the specificity of performance of missions. In air combat with the enemies of the homeland, it was specifically the commander who led his men into the attack. And, understanding the art of tactical employment, he sought to pass his skill on to them, to teach them everything of which he himself had a mastery. With time the motto "Do as I do!" became one of the main principles in training and indoctrination of aviation personnel.

The soldier's saying: "Follow regulations and gain honor and fame" has long since become part of the flesh and blood, as they say, of each serviceman, not out of fear but the conscience of the individual performing his military duty. There is profound meaning in this as well. Vast experience is concentrated in military regulations, experience amassed over the many years of development of the Soviet Armed Forces. Defining the personal responsibility of military personnel for defense of the socialist homeland, regulations demand that they continuously deepen their military and political knowledge, that they thoroughly master and conscientiously care for the weapons and combat equipment entrusted to them. Regulations also oblige commanders directly to supervise combat and political training, to maintain a high level of military discipline, and thoroughly to study their men.

Upon receiving a squadron commander assignment, Maj V. Ryabov began with studying his men and unifying the collective. This was essential because new men had reported for duty in the subunit. It was necessary to achieve smooth coordination of the 2-ship elements, flights, and groups of various tactical designation, and a high degree of individual flying proficiency. The officer also thoroughly understood, however, that he alone could not accomplish this task. Therefore, dividing duties among his deputies in a clear-cut manner, he thoroughly studied headquarters operations involving organization and planning of the training and indoctrination process and assigned his officers specific tasks. Working together with the deputy commander for political affairs, Maj V. Kamagurov, he devised an aggregate of measures, taking into consideration individual features of each aviator. The officer-Communists focused considerable attention on organization of socialist competition among flights and technical subunits. They focused party and Komsomol activists in a prompt and timely manner toward successful accomplishment of assigned tasks.

In this connection I should like to emphasize the following: supported by the party and Komsomol organizations and skillfully guiding their activities, each commander will definitely find them to be determined and aggressive assistants. For this it is necessary continuously to support the activeness and creative initiative of Communists and Komsomol members and clearly to assign them specific tasks in the interests of combat readiness, high-quality, prompt and timely accomplishment of combat and political training schedules and strengthening of military discipline. The commander must personally take part in ideological, political indoctrination work, objectively analyze critical statements and remarks by party members, and promptly make the correct decisions on the basis of these remarks in order to correct deficiencies.

This is a very important element in the job of each commander. The ability effectively to utilize party and Komsomol influence in the interests of increasing combat readiness, flight operations safety, and strengthening observance of regulations is a large and responsible task. Its success is determined in large measure by the extent to which command personnel and subordinates have been taught to do this. It is no secret that the overall success of the squadron and regiment as a whole depends on the teaching skill of flight commanders and their methodological abilities.

Aircraft technician Sr Lt Tech Serv A. Lebedev serves in the flight of military pilot 1st class Capt G. Shevchenko. He has a good record now, but there was a time when this officer was violating military discipline -- he would be late to formation, and he would fail to observe regulations. The flight commander pointed out to Lebedev the error of his ways. Lebedev failed to draw the proper conclusions from his superior's comments and advice. Once he was again late for duty without a good reason. Captain Shevchenko put him on report. Following a discussion with the secretary of the primary party organization, it was decided to discuss Lebedev's conduct at a meeting. A frank and firm discussion was held. Of course the young officer's conduct did not change immediately. Incidentally, the party activists did not limit their response to a discussion at a meeting. They increased demandingness on this party member and regularly explained to him that the demands of regulations have the force of law on all personnel and that it is the duty of every officer, particularly a party member, not only to observe regulations unswervingly but also to keep their colleagues from committing breaches of regulations. Combined efforts by the commander and party members ultimately exerted positive influence on Lebedev. Today he is frequently mentioned in news bulletin leaflets as one of the subunit's finest aviation personnel.

Precise observance of regulations and close contact with the party organization enabled the flight commander to mobilize aviation personnel for achieving excellent results in combat training. The flight placed in competitions for the district Air Forces championship in conduct of air reconnaissance. Capt G. Shevchenko did the best job of all in performing his air mission.

Military pilot-expert marksman Lt Col A. Pozhenskiy also gave his men an example worthy of emulation. He is no longer assigned to our unit, but he is remembered well. Aleksandr Petrovich trained and indoctrinated personnel in a spirit of conscientious observance of regulations. He responded with sensitivity to the men's mood and was the heart and soul of the collective. He was demanding on himself to the highest degree and did not ignore even the slightest departures from execution of party and military guideline documents, regulations, orders and instructions from superiors. He strictly observed uniform regulations. Party member Pozhenskiy served as an example to his men in all undertakings. He had no equal in the regiment in flying ability. At one tactical air exercise he did an excellent job on a reconnaissance sortie and received a commendation from the district Air Forces commander. An instructor, Aleksandr Petrovich skillfully passed on his own experience and know-how to the squadron commanders and to the regiment's leader personnel. And the latter in turn taught the young men. Thus one of the points of regulations was being observed -- each superior teaches and indoctrinates those under him.

Article 2 of the USSR Armed Forces Disciplinary Regulations states: "Military discipline is grounded on awareness by each serviceman of his military duty and personal responsibility for defense of the homeland -- the Union of Soviet Socialist Republics." In order that each serviceman be profoundly cognizant of this point, it is essential not only to conduct regular and systematic indoctrination work, patiently to explain and persuade, but also rigorously to demand unswerving observance of regulations. It is necessary to seek persistently to ensure that a serviceman, regardless of his level of knowledge and

duty assignment, mandatorily considers his each and every action in relation to the demands of regulations and the military oath. An individualized approach is very important here as well.

Speaking at a get-together with party veterans, CPSU Central Committee General Secretary Comrade Yu. V. Andropov stressed: "Conscious discipline is inherent in the nature of the socialist society, and good, conscientious work is a result of this discipline."

Practical experience indicates that the best results are achieved where commanders and political workers skillfully conduct indoctrination work with individuals and constantly rely on the support of the military community, which responds firmly and frankly to any departures from military regulations. Discipline is firm precisely in such subunits, there is a high degree of follow-through, combat and political training is organized in a precise manner, and aviation personnel off-duty routine, rest and recreation are well organized.

We can cite as an example the flight under the command of military pilot 1st class Capt A. Mikhno. This commander learned a great deal from his squadron commander, Maj V. Ryabov. This officer had succeeded in establishing firm discipline in his subunit. Flawless knowledge of regulations governing flight operations, rigorous and conscientious observance of these regulations, professional expertise and the endeavor to raise every pilot to his own level of performance earned him incontestable authority. The squadron Communists elected Captain Mikhno party bureau secretary. This officer skillfully combines high demandingness with constant concern for his men and is thoroughly familiar with the professional qualities of flight and technical personnel, the condition and capabilities of the equipment. It is not surprising that the pilots of his flight receive high marks on all flight assignments.

Captain Mikhno is extremely alert at all training classes, during preliminary preparation and at mission briefings. If anything is unclear he will not rest until full understanding has been achieved. Upon receiving orders, he will ensure that every pilot is thoroughly and accurately briefed. He himself always prepares painstakingly for flight operations. Only after he gains a thorough and proper understanding of all details, mastering a given tactic or maneuver, does he begin teaching his men.

The regimental reconnaissance chief, military navigator 1st class Maj A. Pavlenko, also displays a model example of execution of military duty. He constantly teaches his men to follow regulations to the letter in all things. He has helped many pilots in their development as officers and in training and indoctrinating their subordinates.

There are two senior lieutenants in the regiment: S. Kirillov is a graduate of military aviation technical school, while S. Anosov completed higher education schooling. One would think that his level of awareness should also be higher. That is not the way things are in fact, however. From the standpoint of follow-through, Anosov must be watched like a hawk. If the commander fails to check up on his job performance, one can expect some "surprise." Efficiency reports of such aviation personnel generally contain the following entries: "Requires constant supervision by superiors."

A pilot once discovered during his landing roll that his brakes were not working properly. After he taxied to the ramp, maintenance personnel had to reposition the brake drum ring. Anosov should have performed this procedure when preparing for flight operations, but he had taken the chance that the brakes would make it through one more flight. According to the schedule, after landing and refueling his aircraft, the pilot was to go out again. There was a delay, and they fell behind schedule, resulting in a disruption of flight operations discipline. And this could have resulted in an aircraft mishap....

Officer Anosov, who had shown an unconscientious attitude toward performance of his job duties, evidently had not yet grasped the fact that each and every serviceman must precisely carry out the requirements of regulations, orders and instructions by commanders, be honorable, conscientiously study military affairs, and properly care for the equipment and weapons entrusted to him.

Servicing of aircraft demands great diligence, discipline, conscientiousness, and precision. Sr Lt Tech Serv S. Kirillov possesses these qualities in full measure. He always preflights equipment with a strong sense of responsibility, and he carries out his military duty in a rigorously disciplined manner. Once during a routine aircraft inspection he spotted a crack in a fuel tank. This could lead to a fire in the air. The officer would not release the aircraft and did everything possible to correct the problem as quickly as possible. Kirillov was given a duty assignment promotion for his diligence and conscientious attitude toward his duties.

One of the forms of disseminating the provisions of regulations consists of lectures and discussions on the history of military regulations and the military oath. Regimental museums and combat glory rooms are of inestimable assistance in this regard. Our unit also has such a museum. During the years of the Great Patriotic War 30 of our pilots were awarded the title Hero of the Soviet Union. Veterans were invited to attend a recent regiment anniversary celebration. Acquaintance by aviation personnel with those who in the flame of battle had added to the glory of the regimental colors positively affected the duty performance of today's defenders of the homeland's airspace. They made upgraded socialist pledges. Having specified new performance levels in combat and political training, they proceeded to achieve those performance levels in an honorable manner. The regiment again earned a rating of excellent based on the year's performance results. This is nothing other than an example of prescribed execution of military duty and a contribution by the unit's personnel to the common cause -- strengthening of the might of the Air Forces and, consequently, the defense of our beloved homeland.

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URGENT IMPORTANCE OF AGGRESSIVE COUNTERPROPAGANDA STRESSED

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[Article, published under the heading "Ideological Work to the Level of the Demands of the June (1983) CPSU Central Committee Plenum," by Col V. Makeyev, chief of the propaganda and agitation department, deputy chief of the Air Forces Political Directorate: "Aggressive and Effective Counterpropaganda"]

[Text] Sixty years ago, as a result of the victorious Great October Socialist Revolution, the world's first worker and peasant state was born in Russia. This marked the beginning of the October era, which opened up for the peoples of the world a road to happiness, constructive building, and progress.

The Great October Revolution is near and dear to all honorable people throughout the world. It freed mighty forces of social advance and became the banner of peoples building socialism and communism, an inspirational example for the working people of all countries waging a struggle against the yoke of capital.

The building of a developed socialist society in the USSR became the highest attainment of social advance. No society in history had ever offered or could ever offer the masses so many benefits as were given by socialism. It helped the people become the genuine master of our country, liberated the people from all forms of exploitation, brought an end to unemployment and poverty, offered all citizens, without exception, access to education, to the heights of world science and culture, and achieved a steady growth of production and welfare.

The October Revolution and socialism brought total national liberation to the peoples inhabiting our country. A great brotherhood of people of labor was born and became firmly established in our country, and a friendship among peoples which was unprecedented in the history of civilization was established. All these are great achievements, which have taken firm hold in the life of each and every Soviet family, each and every Soviet citizen.

Developed socialism today is the offspring of all generations of Soviet citizens, of those who were victorious in October 1917, of those who fought on the civil war battlefronts, those who carried out industrialization of this country, collectivization of agriculture and a cultural revolution, those who defended their socialist homeland in the war against fascism, and those who today are continuing the great task of building communism.

The victory of the Great October Socialist Revolution also brought qualitative changes in resolving an age-long problem of mankind -- the problem of war and peace. As we know, imperialism is a source of wars and the danger of war. Socialism, on the other hand, brings peoples peace. Love of peace is an integral feature of the foreign policy of socialism as a societal system, where there are no classes with a vested interest in war. V. I. Lenin pointed out that a world without wars is an ideal of socialism.

Firmly following this statement by Lenin, the Communist Party and the Soviet Government are consistently and unswervingly pursuing a policy aimed at ensuring peaceful coexistence between countries with differing social systems, at eliminating from the experience of society the phenomenon of war. It is for good reason that the Peace Decree was the first decree issued by the Soviet Government.

Imperialism, however, which has firmly linked its destiny, its very existence with militarism and a striving toward world domination, does not like such a state of affairs. Imperialist reaction, frightened by growth of the influence of the USSR and its allies in the international arena, has undertaken fierce attacks on the socialist community and by means of an unprecedented arms race is attempting to disrupt the established military balance.

Enhancement of the role, prestige and authority of socialism in world affairs and its steady movement forward evoke fierce animosity in the camp of imperialist reaction, while any demonstration of the advantages of socialism, its democratic spirit and love of peace serves as a pretext for whipping up an anticommunist and anti-Soviet psychosis in capitalist countries. This campaign assumed a particularly large scale when the Reagan Administration came into power in the United States, when the political situation in that country began to be determined by the most militant elements, whose class hatred of socialism, peace and progress gained the upper hand over an awareness of reality and common sense.

Today in Washington they are openly speaking of direct confrontation with the Soviet Union, of the possibility of victory over the socialist countries in a nuclear missile war. A general strategy of military and ideological contest with genuine socialism is increasingly being supplemented by "psychological warfare." Its purpose is to destabilize the existing system in the nations of the socialist community by means of acts of political sabotage, espionage, and diversified subversive propaganda actions aimed at "disintegrating the adversary's home front." In other words, genuine information-propaganda intervention has been deployed against the USSR and the other nations of the socialist community, intervention being directed by politicians holding extremist positions of "Neanderthal anticommunism."

The conveyor belt of disinformation to deceive public opinion was also revved up to full speed in the other NATO countries. Radio broadcasting is assigned a special role in the subversive effort against socialism. The transmitter antennas of 50 radio broadcasting operations are directed today toward the nations of the socialist community. They include Voice of America, BBC, Radio Free Europe, Radio Liberty, Deutsche Welle, Radio Israel, and radio broadcast facilities in Canada, Sweden, and other countries. In 1947 only

Voice of America and BBC were beaming broadcasts to the USSR, 1 hour a week each, by the end of the 1960's total broadcasting had grown to 170 hours per week, while today 39 broadcasting operations abroad are broadcasting more than 200 hours per day in 24 languages of peoples of the Soviet Union. There has also been an appreciable increase in religious broadcasting operations. In addition, the ideological assets of the Pentagon are being aggressively utilized for subversive activities in the socialist countries. The U.S. military propaganda machine, numbering 204 radio and 80 TV stations, is being extensively utilized in the anticommunist "war of minds."

We must also note the following fact. In the period from 1917 to the present time bourgeois ideologists have invented more than 3,000 different theories, doctrines, and notions aimed at undermining and falsification of socialism. Corresponding propaganda theses have been devised for each of these, aimed at persons with unstable political awareness. This campaign of lies and slander has reached an unprecedented scale today, and therefore it would be a mistake to underestimate its pernicious influence and to be complacent.

"In all indoctrination and propaganda work," noted CPSU Central Committee General Secretary Comrade Yu. V. Andropov at the June (1983) CPSU Central Committee Plenum, "one should constantly take account of a specific feature of the historical period through which mankind is passing. It is marked by a contest between two polar-opposed ideologies, two political courses -- socialism and imperialism -- a contest which is unparalleled in intensity and acuteness throughout the entire postwar period. There is taking place a struggle for the minds and hearts of this planet's billions. The future of mankind also depends to a considerable degree on the outcome of this ideological struggle. Hence one can understand how exceptionally important it is to have the ability to communicate to the broad masses throughout the world in an easily-understood and convincing form the truth about the socialist society, its advantages, and its peace-seeking policy. It is no less important skillfully to expose lying, subversive imperialist propaganda. We need a well-conceived, unified, dynamic and effective counterpropaganda system."

In discussing this point, we must note how very important for present-day practical ideological and political indoctrination work are Lenin's statements regarding the principles of organization of counterpropaganda, which he considered to be one of the most sophisticated and skilled means of ideological influence. As we know, counterpropaganda activity is usually expressed in two aspects -- anticipatory, and unmasking. Both accomplish the same principal task -- to nullify the adversary's propaganda efforts. Methods and approach to accomplishing this task, however, differ. While exposing bourgeois lies and slander expresses chiefly the defensive function of counterpropaganda, when people's attention is focused on exposing views which have already been proclaimed by the adversary, anticipation presupposes forming a Marxist-Leninist attitude toward sociopolitical phenomena and events.

This is why today it is especially important, through the entire system of ideological indoctrination and propaganda work conducted in aviation units and subunits, to give preference to forming in Air Forces personnel fundamental, core knowledge, encompassing matters pertaining to the class struggle.

defense of the socialist homeland, the advantages of socialism over capitalism, etc. In other words, the most relevant task today is that of developing in aviation personnel a kind of immunity to the influence of hostile propaganda, to form a high degree of political awareness and an ability to assess from a class position all phenomena of societal affairs and, on this foundation, to instill uncompromising opposition to bourgeois ideology in all its present-day manifestations. It is important skillfully and effectively to utilize in this work the press, radio, television, the political education system, all forms of mass-political work, literature, and art.

The preciseness and clarity of the ideological position of the Soviet citizen presuppose first and foremost knowledge of the history of the revolutionary struggle and the building of socialism, an understanding of the appropriateness of the socialist reforms which have been carried out, and a feeling of pride in the great accomplishments of socialism. For this it is essential, notes the CPSU Central Committee decree entitled "On the 80th Anniversary of the 2nd Congress of the Russian Social Democratic Workers' Party," clearly and convincingly to present the historic achievements of the Soviet people, gained under the guidance of the Communist Party, the multifaceted activities of the CPSU and its steadily increasing importance in the affairs of our society. In indoctrination work among the toilers, especially young people, one should extensively utilize the fine traditions of the struggle for socialism, endeavoring to ensure that Communists and Komsomol members possess firm knowledge of the heroic history of the party and firmly and unswervingly implement party decisions and policy. We are also focused in this direction by the well-known CPSU Central Committee decree entitled "On Further Improvement of Ideological and Political Indoctrination Work," which denounced a tendency, which still is sometimes encountered in ideological indoctrination practices, a tendency to smooth things down, to sidestep unresolved problems, and to ignore shortcomings and difficulties which exist in real life.

Lenin's methodological principles of counterpropaganda, developed in the decisions of the 26th CPSU Congress and subsequent CPSU Central Committee plenums, are the property of the party as a whole. Guided by these principles, commanders, political agencies, party organizations, and ideological activists in the Air Forces are improving the forms and methods of counterpropaganda work and are making every effort to increase its effectiveness in forming deep ideological conviction in aviation personnel as a principal moral-political quality of the individual. As we know, this quality expresses not only total dedication to the socialist homeland, readiness and willingness to defend it, but also a profound, stable implacability toward its enemies and hostile ideology. It is not mere happenstance that the June (1983) CPSU Central Committee Plenum pointed to the necessity of all-out "development of political vigilance on the part of Soviet citizens, implacability toward hostile views, and the ability to withstand acts of ideological sabotage by the class enemy, opportunistic and revisionist attacks on genuine socialism. Vigorously repelling anti-Sovietism and anticommunism -- this is a constant directional thrust to the activities of party committees and the mass media."

Implacability toward the enemies of socialism is one of the aspects of the ideological conviction of the Soviet serviceman, for love of the socialist homeland and dedication to the ideals of communism presuppose class hatred toward its enemies and the reactionary ideology they propagate. In practical ideological indoctrination work in the line units this means affirmation of a vigorous experiential posture on the part of the armed defenders of the socialist homeland, military ethics and the rules of conduct spelled out in the military oath and military regulations, and a struggle against the antipodes of Communist ethics and morality. Experience indicates that a simple contemplative condemnation of hostile phenomena and the various intrigues of bourgeois ideology is insufficient. What is necessary is a consistent and systematic struggle against alien ways, tastes, customs and views, which sometimes penetrate the military community. Complacency in these things is intolerable.

When instilling in aviation personnel implacability toward bourgeois ideology, toward the enemies of peace and socialism, it is very important comprehensively and convincingly to reveal the danger proceeding from the U.S. imperialists and their aggressive NATO bloc allies. The entire system of political information dissemination, ideological and mass-political work should be so constructed as constantly to remind Air Forces personnel of the intensifying danger of war, their responsibility for strengthening the defense capability of the homeland, and the need for constant readiness resolutely to repulse aggression, from whatever quarter it might come. Today this is the central task of commanders, political agencies, party and Komsomol organizations. In performing this task, one should constantly and comprehensively explain to aviation personnel the Leninist foreign policy of the CPSU, peace initiatives of the party and Soviet State directed toward preventing a nuclear missile world war, consistently and persistently expose the militarist plans of imperialism, particularly U.S. imperialism, and persuasively unmask the anti-popular essence of imperialist policy, ideology, and ethics. Particular attention should be focused on demonstrating the reactionary substance of contemporary imperialist armies, the ideological and moral debauchery of the defenders of the class interests of the bourgeoisie, the readiness and willingness for adventurism, sadism and cruelty of the mercenaries of capital.

Air Forces military educational institutions are called upon to play an important role in exposing bourgeois ideology and indoctrinating hatred toward imperialism. In the process of ideological conditioning of officer candidates and other enrolled personnel it is essential not only aggressively, purposefully, and consistently to debunk attempts by bourgeois ideologues to distort and falsify Marxism-Leninism, but also to teach young aviation personnel the methodology of critiquing imperialism, the ability to wage an aggressive campaign against its acts of ideological sabotage. Means of visual agitation should be utilized across a broader range to attain these ends.

It is a paramount task of counterpropaganda to be on the offensive at all times. All commanders, political agencies, party organizations, ideological workers, and all Communists in the military are called upon to perform this task. The effectiveness of counterpropaganda depends to a decisive degree on the ideological-theoretical conditioning of propagandist cadres and their ability

to raise the level and effectiveness of all ideological, mass-political work, political training and party instruction to the level of today's demands. Political agencies, party committees and bureaus, in conformity with the decisions of the June (1983) CPSU Central Committee Plenum, should think out and implement an effective program of measures toward this end. The proceedings and recommendations of the "Aggravation of the Ideological Struggle in the World Arena and Political Indoctrination of Working People" All-Union Scientific and Practical Conference, held in Tallinn in October of 1982, can serve as a basis for such a program.

As we know, the propagandist's word can reach its destination and produce the required result only if he is clearly aware of what is important to people, as well as their attitudes, aspirations, and needs. Hence systematic study in the line units of the men's opinion and the experiential posture of the various categories of personnel is assuming increasing importance. Staff and volunteer propagandists, agitators, political briefers, and leaders of officer Marxist-Leninist training groups, warrant officer political instruction groups, political instruction classes for enlisted personnel and noncommissioned officers, schools, study groups and seminars within the party and Komsomol mass-political instruction, economics education and worker political enlightenment system are called upon to accomplish this important task together with political agencies and party organizations. Toward this end one should continuously, not occasionally, synthesize and analyze issues arising with officers, warrant officers, the members of their families, enlisted personnel and NCOs, Soviet Army civilian workers and employees, providing prompt and correct answers to questions which arise. One should promptly adjust lecture-propaganda and mass-political work plans and schedules taking these questions into account. This will strengthen their effectiveness and thus increase the effectiveness of counterpropaganda.

Socialism is experiencing a historic advance. And this objective reality of the contemporary era is broadly reflected in all ideological, mass-political work conducted in the units, aimed at indoctrinating aviation personnel who are totally dedicated to the homeland and the Communist Party. Just as all Soviet citizens, military aviation personnel gaze confidently into the future. With their selfless military labor they are affirming great Communist ideals. Herein lies the source of our optimism and an inspirational stimulus of vigorous, aggressive counterpropaganda, which exposes the insidious intrigues of the enemies of socialism.

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DETRACTORS OF SOCIALIST SYSTEM 'DEBUNKED'

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[Article, published under the heading "At the Fronts of the Ideological Struggle," by Candidate of Historical Sciences Lt Col Ya. Ren'kas: "Genuine Socialism and Its Falsifiers"]

[Text] Growth in the influence and prestige of genuine socialism in the international arena is evoking savage rage on the part of our class adversaries. The more substantial the successes of the Soviet people in building communism, the greater the degree of sophistication with which bourgeois propaganda attacks our system.

The USSR is exceeding the industrially developed capitalist countries in rate of economic growth. In the period 1970-1981 gross societal product rose by 72 percent and national income by 60 percent. During that same period real per capita income increased by more than 50 percent. Not one capitalist country can boast of such figures. The rate of growth has been particularly rapid in certain of the most important branches of industry. For example, the USSR today generates 26 times as much electric power as it did before the war, is producing almost 32 times as much mineral fertilizer, and more than 100 times as much chemical fibers, threads and yarns. The Soviet Union has become the world leader in production of many major product items, including production of crude oil, iron ore, pig iron and steel, cement, tractors (on the basis of total horsepower), road diesel and electric locomotives, household refrigerators, woolen textiles, leather footwear, animal oil, etc.

We of course have our difficulties and problems, but all of them are connected with future economic growth, not with a crisis, as the apologists of capitalism claim. Crisis phenomena are observed, however, in the West. An economic crisis, currency crisis, energy crunch, rise in unemployment, inflation, decline in production -- not one of these phenomena is characteristic of the Soviet economy. But bourgeois theorists need the propagandist's myth about a nonexistent crisis in the Soviet economy in order to claim that socialism and capitalism differ little from one another, and therefore there is no need to strive to replace one social system with the other.

Western propaganda incessantly trumpets the allegedly "hopeless" state of Soviet agriculture, one after the other casting forth provocational notions to the effect that collective forms of agriculture have supposedly demonstrated their bankruptcy in comparison with capitalist private-enterprise agriculture. This old lie is easily refuted by facts, which the falsifiers, incidentally, deliberately fail to mention. In a period of 3 five-year plans, for example (from 1965 to 1980), agrarian production in the USSR increased by 50 percent, while agrarian production growth in the United States was only 29 percent, and approximately 31 percent in the EEC member countries.

The structure of the Soviet diet has improved considerably in recent years. We should note that consumption of meat in this country increased (per capita) from 41 kilograms in 1965 to 57 in 1980, milk -- from 251 to 305 liters, and the same with vegetables and fruits, eggs, vegetable oil, and fish. At the same time there was a decrease in the consumption of flour products and potatoes. But this indicates merely a rise in Soviet living standards.

In short, no matter what aspects of our life are reflected by a growth curve, in every instance it rises rather steeply, which is totally at variance with the hostile myth of a crisis in Soviet agriculture. Incidentally, a scientific analysis of our agricultural capabilities and reserve potential indicated that the USSR possesses a realistic potential greatly to increase production of the highest-quality food products without doing detriment to the monetary income of the population and consequently to consumer demand. As regards practical measures taken on this important problem, they are embodied in the USSR Food Program, which extends up to the year 1990.

In connection with this I should like to state the following to our detractors. While today hundreds of millions of persons are going hungry in various parts of the earth, and more than 1 billion persons are threatened with hunger, in the USSR the question at hand is not how to feed our people but rather how to raise the level of consumption of the most valuable food products to optimal, scientifically substantiated standards. Specifying in the Food Program future prospects for growth and development of agriculture, the Communist Party sets for itself the goal of improving the structure of our people's diet and doing this as quickly as possible.

Another slanderous cliché is constantly present in the poisonous arsenal of anti-Sovietism -- expatiations about "forgetting" the needs of the consumer in the USSR. Here as well, however, the falsifiers display their total impotence. The entire world knows that our party's highest program goal has been and continues to be a steady rise in the material and cultural living standards of the Soviet people. This task was advanced in 1971 in the five-year national economic development plan as the main, determining target. This meant that it would determine the focus of the national economy of the USSR for an extended period of time.

Somewhat more than 10 years have passed since then. The party has kept its word. Today there is not a single Soviet family in which real per capita income has not risen. In the 11th Five-Year Plan as well, as was stressed at the 26th CPSU Congress, improvement in living standards continues to be the party's main task. Therefore priority attention is being devoted to problems

which are of considerable importance to us: food, housing, supply to the public of goods in high demand, development of the service industry, sociodemographic, etc.

Here are some specific figures. Real per capita income in the Soviet Union will rise by 16.5% during the five-year period. Average monthly worker and employee earnings will increase by 14.5%, and kolkhoz farmer income by 20%. This is accomplishing the task of equalizing monetary income between urban and rural toilers. In addition, state retail prices on basic food and nonfood items, rents, public transportation fares and utility rates will remain unchanged. At the same time expenditures for social needs from public consumption funds will increase by 20% over the five years, that is, just as in previous years, these funds will grow more rapidly than wages, which will strengthen to an even greater extent the economic foundation for implementing the constitutional rights of Soviet citizens to education, health care, a pension, and protection for mothers and children. Increased assistance is being given to families with children as well as to newlyweds, and working and living conditions are improving for working women. This is eloquently attested by the corresponding party and government decrees in recent years. In addition to this, old-age and disability pensions are increasing significantly, as are loss-of-breadwinner pensions, and pension terms are equalizing for kolkhoz farmers and employees of state enterprises.

Large-scale housing construction is in progress. In the five years more than 50 million persons will move into new housing. There will occur an attendant improvement in the comfort level of housing and the level of provision of public services and amenities. There will also be a substantial increase in aid and assistance to working people who are building housing on a cooperative basis or as individuals. New schools and hospitals, sanatoria and rest houses, nursery schools and kindergartens, vacation facilities and preventive clinics -- these facts characterize the current stage in development of social programs for raising the material and cultural living standards of Soviet citizens.

We have described above the principal course of Soviet domestic economic policy and the main points of the plan for development of the USSR economy in 1981-1985 and the period up to 1990. The cited facts and figures constitute genuine Soviet realities, which are welcomed by the progressive world community. But it would be a waste of time to look for these facts and figures on the pages of the reactionary bourgeois press. The apologists of capitalism make no mention of them.

In its unrelenting efforts to discredit genuine socialism, imperialist propaganda continues to pour out floods of slander against the political system of our society and attempts to present recipes for "improving" the existing state of all the people. An ideological commodity of this kind is carefully packaged in the wrappings of pseudoobjectivism: socialism is not a bad system, they say, but it should be made more liberal, that is, there should be permitted a free contest for power among various political factions and groupings. Whose interests could they represent, these various "political factions," one might ask. With whom will they contest power? With the Soviet authorities? The true intentions of subversive imperialist propaganda are revealed

precisely here: in the opinion of bourgeois ideologues, it is tasked with gradually and imperceptibly eroding away the basic points of Marxist-Leninist teaching on dictatorship of the proletariat and its vanguard role in building socialism.

In their attacks on our political system the ideologues of anticommunism particularly diligently "analyze" the Communist Party's leadership role, viewing its status in society as a "monopoly by a special social group." But the 18-million-person detachment of Communists, which contains the cream of our people and expresses our people's root interests, can by no manner or means be called a special social group. On the contrary, the Leninist party enjoys the boundless trust and confidence of all strata and social groups in our society, amasses the people's will and experience, and embodies them in its domestic and foreign policy. Constituting the guiding and directing force of our society and the nucleus of its political system, pursuant to the USSR Constitution, the CPSU unites the efforts of all governmental and public organizations in the great arena of building communism. One might ask just what this "monopoly of leadership" constitutes? More than anything else it is genuine and faithful service to the people, to the cause of all the toilers.

The Soviet Union is the first worker and peasant state in the history of mankind, where power belongs to the people in actual fact, not in words alone. For example, one out of every four citizens above the age of 18 in the USSR takes part in one form or another in daily management of the nation's affairs. The overwhelming majority of party and soviet leaders at the national and republic level, as well as local authorities, are of worker and peasant origin. The trade unions, with a total membership of approximately 130 million working people, take active part, just as other public organizations, in managing the affairs of state and society, in resolving political, economic, and social matters. And the following principle is strictly observed: each and every Soviet citizen can openly express his opinion without fear of persecution.

The situation is quite different in the countries of the West. In the U.S. Congress, there are virtually no workers or farmers, while there are only a very few women and Negroes. The Americans themselves call the Senate a "millionaire's club." As for the notorious bourgeois democracy with its vaunted freedom, how can one explain away the fact that the American political secret police is "keeping tabs" on virtually the country's entire adult population? The FBI has 78 million fingerprint cards and files on 34 million Americans who, in the opinion of the Washington Administration, represent a potential threat to national security. But even this has proven inadequate. President Reagan has now authorized the U.S. intelligence services to spy literally on everybody, many of whom are not even suspected of breaking the law. One cannot help but ask whether the term "democracy" is even appropriate here.

An important role in "psychological warfare" is assigned to falsification of the foreign policy activities of our party and the Soviet State. An unprecedented propaganda hue and cry was raised over the myth of a "Soviet military threat." The mass information and propaganda media work day and night to frighten the man in the street, filling him with sensational reports about the alleged expansionist aims of the USSR. Government officials and journalists,

writers and professional scientists are involved in this kind of propaganda. Numerous opuses are being glibly produced, the leitmotiv of which consists of claims that Soviet citizens think about nothing else but attacking the countries of the West and establishing a socialist system there.

The primitive and antiscientific character of the myth of a "Soviet military threat" is quite obvious. Our country threatens nobody and does not seek confrontation with any country in the West or East. It never has sought and does not now seek any military superiority whatsoever over other countries and peoples. Securing a firm peace on earth always has been and continues to be the highest aim of the foreign policy of the Communist Party and Soviet State, and the most important function of the Soviet Armed Forces in present-day conditions -- defense of the socialist homeland -- is dictated solely by external factors. As long as the countries of the West, led by U.S. imperialism, continue intensifying material preparations for war, building up their military potential, constant attention toward this nation's defense capability will continue to be a natural and vitally important task of the CPSU and the Soviet State. "We shall continue in the future," stressed Comrade Yu. V. Andropov at the June (1983) CPSU Central Committee Plenum, "doing everything necessary to ensure the security of our country, our friends and allies, and we shall continue increasing the combat might of the Soviet Armed Forces -- a powerful factor in restraining the aggressive aspirations of imperialist reaction."

Mankind's advance has been swift in our era, an era of revolutionary renewal of the world. It has been dictated by a number of factors, the most important of which is genuine socialism -- a system of societal relations, the very existence and successes of which have become a most powerful accelerating agent for social processes on a world scale. The toilers of the nonsocialist part of the planet compare their status with the achievements of socialism. These achievements are forcing the ruling circles in the capitalist countries to become increasingly responsive to the demands of the masses. Finally, these achievements serve as a point of reference for progressive forces in developing countries. And no vain attempts by the imperialist bourgeoisie and its ideological flunkies are able to conceal the immutable fact that socialism alone represents the most dynamic force of the present day, that socialism alone creates conditions of life worthy of the man of labor. Soviet realities are a convincing confirmation of this.

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AIRCRAFT MAINTENANCE PERSONNEL URGED TO BOOST JOB PROFICIENCY

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[Article, published under the heading "For a High Degree of Combat Readiness," by Hero of Socialist Labor Engr-Col Gen V. Skubilin, deputy commander in chief of the Air Forces for aviation engineer service, chief engineer of the Air Forces: "Working Efficiently to Master New Equipment"]

[Text] The Communist Party and Soviet Government, displaying tireless concern for strengthening this country's defense capability, always attached and continue to attach great importance to equipping the military, including the Air Forces, with modern weaponry.

At the dawn of development of the Soviet State, Vladimir Il'ich Lenin viewed technical equipping of the army to be a most important indicator of a country's military power. At the same time he persistently recommended comprehensive and careful study of the latest advances in military technology, recognizing trends in the development of technical thinking, and mastering all types of weapons, all means and tactics of armed struggle against the enemies of the world's first worker and peasant state.

These statements by our leader have retained their significance in our troubled times. Endeavoring to achieve military superiority over the USSR and the other nations of the socialist community, U.S. imperialist reactionaries and their NATO allies place particular emphasis on developing and building new and more destructive weapons and combat equipment. Correspondingly our efforts also are directed toward further scientific quest for purposes of defense. The interests of defending world peace and the security of the socialist homeland demand effective utilization of scientific and technological advances, thorough study of modern aircraft systems entering the Air Forces arsenal, and all-out improvement of existing and development of new methods of subunit command and control and combat equipment operation. Soviet fighting men should seek to ensure that our weapons are at all times powerful, the most up-to-date and menacing to any aggressor.

Obviously no matter how well armed the Air Forces may be, no matter how sophisticated the equipment they possess, this is insufficient. It is essential that flight and engineer-technician personnel, who are entrusted with

modern aircraft systems, possess excellent knowledge of these systems, a consummate mastery of them, and approach in an innovative and responsible manner the accomplishment of practical tasks pertaining to further strengthening the combat readiness of aircrews, flights, squadrons, and regiments.

It is important thereby constantly to bear in mind that today's fighters, bombers, and other military equipment represent considerable material assets. It is therefore very important that each and every aviation engineer service specialist intelligently and conscientiously service and maintain airborne systems and equipment, keep them in good working order and in a state of continuous combat readiness. Considerable opportunities for this are opened up in the process of combat training, flight operations, and tactical air exercises with practical performance of fire and tactical missions at ranges.

The role of engineer-technician cadres in mastering new aircraft systems and in scientific organization of their servicing, maintenance and combat employment is steadily growing. By virtue of the very essence of their profession, they are at the cutting edge of scientific and technological advance. The quality and effectiveness of maintenance of modern equipment, its battleworthiness and combat readiness depend in large measure on the level of their specialized training, knowledge of aerodynamics and other subjects, their experience, organizer abilities, aggressive innovativeness, and ability to work with others.

The ability to organize one's own labor and that of one's subordinates in a scientific manner is a genuine behest of the times. This ability is grounded and perfected in the process of training, in training drills, flight operations, and in performing unsupervised work assignments. It is quite understandable that for this one requires modern training facilities, which meet increased demands, sophisticated teaching methods, high demandingness in grading knowledge and skills of personnel in test situations, proficiency rating examinations, and during inspection and oversight in the process of daily job performance.

Growth in the job proficiency of engineers, technicians, and mechanics has a direct influence on the quality of all types of jobs performed on aircraft equipment, servicing and maintenance, complicated adjustment, calibration, tuning, and other operations. Creative thinking by efficiency innovators, directed toward increasing the reliability of aircraft equipment and improving the process of training personnel, is stimulated on a foundation of thorough knowledge.

Indicative in this respect is the work experience of the aviation engineer service headed by officer V. Bukharov. They attach paramount importance to matters pertaining to mastering modern systems, to increasing the level of technical sophistication of personnel, and strengthening job performance discipline. The collective has established an exemplary training facility, and advanced methods of training classes and practice sessions have been conceived and are being efficiently adopted. As a result they have eliminated cases of equipment malfunctions due to the fault of aviation engineer service specialists, the number of excellent-rated aircraft is growing, and there is occurring a steady improvement in the proficiency rating of personnel and the

combat readiness of subunits. Aviation personnel always bear in mind the statement made by USSR Minister of Defense MSU D. F. Ustinov, member of the CPSU Central Committee Politburo, that combat readiness is a fusion of the technical equipment of troops, their military proficiency, moral-political, psychological and physical conditioning, organization, readiness and willingness on the part of each Soviet serviceman to perform laudable deeds for the sake of carrying out his military duty to the homeland.

Not everywhere, however, is adequate concern displayed for expanding the technical knowledgeability of servicemen. In some units a good many personnel are not involved in technical training. Sometimes study of the equipment is of an abstract nature and is poorly linked to the specific work assignments of aviation personnel. There occur violations in planning, organization and conduct of commander training. An atmosphere of innovative search has not yet been established in all units, reserve potential is not always revealed, and achieved results are not always assessed with true party rigorousness.

Such an attitude toward increasing one's professional knowledge and improving the quality of aircraft servicing and maintenance is especially intolerable today, when differentiation of jobs is taking place, in particular technical occupational specialties. The information essential for doing one's job is increasing, becoming updated, and becoming increasingly complex. Successful accomplishment of job duties by each and every aviator is possible only under the condition of constant unsupervised work effort. Only skill honed to perfection and genuine technical knowledgeability will enable the aviation engineer service specialist to carry out his duty in a worthy manner.

The decisions of the 26th CPSU Congress and the June (1983) CPSU Central Committee Plenum focus party members in the military on persistently instilling in each and every serviceman an inner conviction about the need for continuous personal improvement. It is precisely such a conviction, developing into a need, which stimulates daily, persistent work on the part of each and every engineer and technician to improve himself, for the process of development of aviation engineer service officers ends neither at the service academy nor at the service school. They must "polish their skills" while serving in a line regiment, since thorough mastery of knowledge is possible only in the process of its practical application. In what proportions labor expenditures should be invested in such "polishing" is important here as well. It is a good thing if a moderate amount of time is spent on this, and it is a quite different thing when this period unwarrantedly stretches out many months and requires that a specialist be sent to industrial enterprises and to a tour of duty in other units in order to study a specific aircraft.

The problem of making the teaching process more comprehensive and intensive at Air Forces higher educational institutions remains pertinent in connection with this. Aviation units expect to receive from service schools and academies specialists who, on the basis of adequate fundamental and applied training, can analyze and predict the condition of aircraft equipment, can evaluate the efficiency of a system as a whole and its separate component parts, and have the ability efficiently to organize the training and indoctrination process. The main thing here should be not only growth in the technical and specialized knowledgeability of personnel, but also and primarily an increase in combat

readiness, reliability of aircraft equipment, and securement of flight operations safety. Service school cadets and academy enrolled personnel should be trained for this in a purposeful manner.

We know that upon completion of schooling there begins a new, very important stage in the further development of a specialist, involving practical activity. The aviation unit is the center of this work. It is precisely here that the officer deepens his knowledge of specific equipment and perfects his skills in its efficient servicing and maintenance. Unfortunately not all service school graduates yet fully understand the importance of this form of training and do not fully utilize the great potential it offers.

Experience indicates that the more attention one-man commanders devote to training classes and drills, the more appreciable the results are. The increased combat capabilities and complexity of modern aircraft equipment and armament, the crew-served nature of their employment, and the large volume and diversity of various servicing and maintenance activities require careful planning, precise organization and conduct of training classes and drills, a high degree of discipline and follow-through on the part of the specialists, as well as diligence and persistence. In these conditions an important role is played by the commander's technical competence, his knowledge of the specific features of servicing and maintenance of aircraft systems, and the ability to ensure coordinated work by his deputies, to guide their efforts toward increasing the level of the men's professional expertise.

Particularly high demands are imposed on the breadth of technical knowledgeability of aviation engineer service officers. They should be prepared rapidly to master what for them is a new aircraft and its armament, they should be capable of skillfully teaching and indoctrinating their men, and capable of developing technical innovativeness, directing it toward looking for and adopting in a practical manner the most effective techniques of servicing, maintenance and combat employment of aircraft.

A wealth of experience has been amassed in vanguard aviation units in training highly-proficient aviation engineer service specialists and in exemplary servicing and maintenance of equipment and weapons. In the unit in which party member officer V. Fursa is the deputy commander for aviation engineer service, for example, the command and party organization devote serious attention to developing in personnel a high level of technical knowledgeability, a solicitous attitude toward and love of aircraft equipment, as well as organization of socialist competition for thorough study and excellent maintenance of systems and their economical utilization. All these things combined have made it possible to ensure a high level of combat efficiency and reliability of aircraft equipment.

The regimental aviation engineer service has at its disposal well equipped laboratories and training facilities. New working display stands and unique installations have been added to the training classrooms. The training facilities of the squadrons have also been literally transformed. All this greatly helps in technical training, gives it a servicing and maintenance directional thrust, expands the breadth of knowledgeability of aviation personnel and enables them more thoroughly to study the complex aircraft systems

and fully to utilize their combat capabilities. The majority of pilots, navigators, engineers, and technicians can precisely pinpoint the cause of malfunction of any given unit, assembly, or system.

In some units and subunits, however, there are shortcomings in study, servicing, maintenance, and handling of aircraft equipment. Not everywhere are vigorous measures being taken to correct these deficiencies and to develop in specialists a strong sense of personal responsibility for performance of their job duties. A poor methodological level of organization of training classes, inadequate quality of servicing and maintenance procedures, and a poor level of job proficiency on the part of certain specialists sometimes lead to equipment malfunctions and a shortened equipment service life. The capabilities of training facilities are also not fully utilized in some units. Display stands, diagrams, and models are often kept as museum exhibits and do not serve as training aids.

Engineer-technical training is the main type of instruction and learning for aviation engineer service specialists. It is conducted on a systematic basis throughout the entire training year on specially designated days. Its principal form for aviation engineer service officers is independent study. Engineer leader personnel of units and subunits are given individual assignments on specific topics. Immediate superiors verify their execution. The forms of this verification can vary: questioning on a specific topic, inspection of class notes, holding a class or directing a practice drill, a specialist addressing personnel, etc.

For the remainder of aviation engineer service officer personnel, topics for independent study and lists of practice drills are determined for each training group by the unit engineers in the specialty areas. They are included in the engineer-technical training schedule, which specifies the required number of hours on each topic and the seminar instructor. Mastery of the independently-studied topic is verified at a seminar session with a quiz and checking classroom notes, with grades answered in the gradebook. Practice drills are conducted in the process of scheduled commander training as well as on aircraft equipment maintenance days. Their purpose is to develop solid skills in performing specific operations in a limited amount of time. Specialists who have thoroughly studied topic items both theoretically and practically, but who lack solid skills in performing maintenance procedures are allowed to participate in practice drills.

Training classrooms and simulation equipment are made available to aviation specialists for scheduled independent training. They are given competent consultation on the items being studied, as well as a selection of literature and visual training aids.

A particularly important role in organizing officer independent study is played by the engineer personnel category of deputy commanders of aviation units for aviation engineer service. Success depends in large measure on their organizer abilities, purposefulness, and persistence. Each of them is called upon to be a mentor and skilled leader. They must not only teach others but learn as well. Their job is responsible and honorable, interesting and far from

drab. It gives the aviation engineer the opportunity fully to reveal his job-related qualities and professional maturity.

As we know, engineer-technical training occupies a leading position in the combat training of Air Forces personnel. It is the constant focus of attention by commanders, political agencies, staffs, unit and combined unit aviation engineer service officials, party and Komsomol organizations. Not everywhere, however, is this important matter adequately addressed. As a result, due to a poor level of professional knowledge and inadequate job proficiency, some aviation personnel make mistakes in operation and maintenance of fixed-wing and rotary-wing aircraft in the air and on the ground and fail conscientiously to carry out the requirements of the appropriate formal instructions, manuals, and other documents.

Discipline, organization, and objective appraisal of achieved results are very important in successfully mastering modern aircraft equipment and its skilled employment in the process of working on the most complex training problems. It was noted at the June (1983) CPSU Central Committee Plenum that genuine efficiency and a conscientious attitude toward public property and utilization of material, labor, and financial resources are an inseparable trait of contemporary economic thinking. This party demand applies directly to Air Forces personnel, the daily practical activities of whom involve maintenance and operation of modern aircraft, their employment in the performance of diversified combat training missions.

Here too, however, not all problems have been fully resolved. It was ascertained, for example, in the course of inspections in the concluding phase of the training year that some leader personnel have a formalistic attitude toward organizing and conducting training activities, fail to display persistence, and do not offer a personal example in continuously increasing one's knowledge of theory and improving skills. Adequate demandingness is not always imposed on personnel during examinations of knowledge of aircraft equipment, and unwarrantedly high grades are sometimes given. The approach to such a critical matter of course does not help improve the job proficiency of aviation personnel. Also uncovered were instances where pilots, engineers, and technicians have their knowledge of airplane or helicopter construction tested to an extent which they do not require in order to perform their job-related duties. This results in nonobjective conclusions about the level of personnel technical knowledge.

Aviation unit methods councils should continuously scrutinize progress in training activities. It is advisable in each training period to discuss matters of methodology, organization, and conduct of training activities taking specific tasks into account. All the best should be synthesized and aggressively incorporated into practical training and indoctrination of aviation personnel.

Socialist competition also plays an enormous role in mastering combat equipment. It mobilizes aviation personnel to achieve successful accomplishment of training schedules and performance of tasks assigned to aviation personnel, and develops in them a feeling of personal responsibility for mastering the

equipment and weapons entrusted to their care, plus initiative and mutual assistance. The June (1983) CPSU Central Committee Plenum pointed to the necessity of concentrating principal attention in organizing competition on boosting qualitative indices and improving utilization of material-technical resources and work time. For Air Forces personnel this demand signifies that the campaign for qualitative indices in working on training tasks and exercises and in training proficiency-rated specialists should become a most important emphasis area. Particularly since aviation engineer service specialists are working under the slogan "A higher level of mastery of new equipment."

The training year has come to an end. It is now very important carefully to analyze in each military collective the state of engineer-technical training, to reveal deficiencies and to take necessary measures, in order that errors and deficiencies not be repeated in the new training year. Each and every serviceman should become permeated with a feeling of personal responsibility for successful and high-quality accomplishment of all assigned tasks directed toward further improvement of the job proficiency of Air Forces personnel and toward increasing the combat readiness of aviation units and subunits.

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REGIMENTAL COMMANDER DISCUSSES TRAINING YEAR SUCCESSES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 18-19

[Interview, published under the heading "For a High Degree of Combat Readiness," with GdsCol G. Zadvinskiy by AiK correspondent; date and place not specified: "Reserve Potential in Competition"]

[Text] The training year has come to an end in the units and sub-units of the Air Forces. Commanding officers have evaluated the military labor of flight and engineer-technician personnel. The aviators under the command of military pilot 1st class Gds Col G. Zadvinskiy have achieved considerable success in air, weapons, and tactical training. Our correspondent met with and interviewed this experienced commander.

[Question] Gennadiy Stepanovich, what event of this past training year has left the deepest imprint on your outfit?

[Answer] It is of course the CPSU Central Committee Plenum which was held in June, a signal event in the life of each and every aviator of our guards outfit. Inspired by its decisions and the high praise given to the USSR Armed Forces by CPSU Central Committee General Secretary Yuriy Vladimirovich Andropov, we sought to respond with deeds to the party's paternal concern for strengthening our country's defense capability. We approached our assessment of the labor of each and every aircrew, each and every maintenance specialist precisely from the standpoint of the Plenum demands. The socialist competition which took place in the squadrons under the slogan "Increase vigilance, reliably ensure the security of the homeland!" had a positive effect on increasing the activeness and initiative of flight personnel, engineers and technicians. In discussing what forms the basis of the regiment's achievements, I cannot help but note the atmosphere of innovativeness, quest, and competitiveness in training activities and flight operations. For example, the Komsomol members came forth with an initiative entitled "a Komsomol guarantee to aircraft servicing and maintenance." This movement, approved by the command and supported by the party organization, has today encompassed literally all subunits. A great deal to help its dissemination has been done by Komsomol activists Guards Senior Lieutenant Technical Service Veremeyenko, Engineer-Lieutenant Limanskiy, Lieutenant Babkin, Warrant Officer Kovbasyuk, Private 1st

Class Bakiyev, and others. Soon after the June CPSU Central Committee Plenum, several of our aircrews took part in a tactical air exercise involving mock combat missions on a distant range. We must note that both our veteran and inexperienced pilots did an excellent job. Guards Major Voronin, Captain Dyuzhenko, Lieutenant Babkin, and others hit their targets on the first pass and returned to base victorious. The guardsmen are working aggressively and persistently to increase their degree of professionalism and are doing a fine job of meeting socialist pledges. The squadrons are moving upward. It has become a firm rule in the aircrews and groups to view each success as a foundation for a further rise in combat proficiency and increased combat readiness. We are pledged to do so by the heroic pedigree of this famed unit. Every newcomer who reports for duty in this decorated guards regiment learns from the veterans that in the very first months of the Great Patriotic War the regiment's pilots, defending Leningrad, the cradle of the revolution, destroyed 160 fascist vultures and that Lieutenant Klykov, fighting alone against 10 Messerschmitts in the air over the Neva, shot down an enemy aircraft, and when his aircraft burst into flames in the unequal contest, he performed an aerial ramming. A feeling of pride is aroused in today's aviators by the fact that in the course of the war the regiment flew almost 8,500 combat sorties and destroyed more than 450 fascist vultures. A total of 22 valiant fighting men were awarded the coveted title Hero of the Soviet Union for these victories. Thrilling to the exploits of the combat veterans of their regiment, our aviators are filled with an ardent desire to build upon the fighting traditions of this guards unit. The finest include party member military pilot-expert marksman Bokach, awarded in peacetime the Order of the Red Star and the For Service to the Homeland in the USSR Armed Forces Order, third class. Young people take precisely such persons as this vanguard officer as a model for emulation, and from them they learn to carry out their military duty in an exemplary fashion.

[Question] Relate to us in more detail about those servicemen who are the authors of advanced know-how and about how they have achieved the summit of combat maturity.

[Answer] First of all I should like to note that in the unit we have synthesized the personnel training and indoctrination experience and know-how of party members Guards Lieutenant Colonel Bezlyudnyy, Guards Captain Bychkov, and other officer-leaders. They are distinguished by party principledness, efficiency, inexhaustible energy, and aggressive enthusiasm. They have achieved successes in their level of job proficiency thanks to persistence and purposefulness in their work and, of course, precise organization of the training and indoctrination process in the squadrons. The squadron and flight commanders keep a strict watch to ensure that training classes, practice drills and flight operations readiness inspections take place rigorously according to schedule. I should like in particular to discuss the role of socialist competition. It is no secret that it is a powerful means of further increasing the level of air proficiency and strengthening combat readiness. And officer-leaders set the tone in competition. In this connection I recall a party meeting in the 1st Squadron which was held at the end of the winter training period. At that time party member Korzun and others discovered deficiencies in organizing competition. Deserved criticism was leveled at the party bureau for showing inadequate concern about publicity and comparability of performance

results by the competing officers and for failing to ensure prompt and timely execution of pledges. This criticism proved to be somewhat unexpected to the squadron commanders and members of the party bureau. They had believed that everything was fine regarding organization of competition. Meetings had been held at the beginning of the training year in all flights, at which individual and subsequently group pledges had been made. Subsequently competition results were totaled up on a regular basis. The squadron commander would promptly announce who had taken first and last place, and pennants and prizes would be awarded to the winners. Nor were combat and political training results cause for any particular alarm: the majority of crews were showing good, stable results in air proficiency and in other subjects, and proper military discipline was being maintained in the subunit. Nevertheless party members perceived signs of complacency behind the generally good state of affairs and satisfactory situation. At the time they also made their thoughts known on this score, stating that a persistent campaign for prompt and full accomplishment of individual pledges, securement of comradely assistance in training, and utilization of reserve potential for creating genuine competitiveness in preparations prior to flight operations and especially during flight operations should become the main focus. The party organization secretary and bureau members discussed all critical comments at their next meeting. The squadron commander then addressed a meeting of officers on increasing their feeling of personal responsibility for carrying out the instructions of the USSR minister of defense and the chief of the Main Political Directorate of the Soviet Army and Navy on socialist competition. The squadron command realized that these general measures had to be reinforced with organizational work first and foremost by party bureau members and officers directly in the crews and flights. It considered a personal example by the party member-officer in adopting specific, realistic pledges and in their exemplary execution to be an important condition for increasing the effectiveness of socialist competition. The commander, political worker, secretary, and party bureau members spoke individually with the officers, helped them determine what performances to seek to achieve in air proficiency, and suggested how they could better organize competition among their subordinates. They concerned themselves with ensuring extensive publicity of competition among officer personnel. At the end of each week the squadron commander would announce at a meeting of his officers which ones were successfully meeting their pledges and why a given aviator was lagging in air, weapons, or tactical training. Lieutenant Colonel Bezlyudnyy promptly suggested to the leading performers what help should be given to lagging comrades. Active officer participation in the competition infused it with a spirit of innovativeness and initiative.

[Question] What contribution to this cause has been made by the subunit's Komsomol organization?

[Answer] It initiates many useful undertakings. For example, its secretary, Senior Lieutenant Technical Service Veremeyenko, having consulted with the squadron deputy commander for political affairs, suggested preparing and discussing at a meeting of Komsomol members the question of observance of standards of Communist ethics and morality. This agenda evoked considerable interest on the part of Komsomol members. They subjected to criticism those individuals who had shown a disrespectful attitude toward their comrades and sometimes concealed the misdeeds of discipline violators. Debates and a special

evening event, dealing with matters of ethics and follow-through, were held by decision of the Komsomol meeting. The squadron party bureau skillfully disseminates advanced know-how. At the initiative of the party organization secretary, a report on methods of organizing competitions was presented by party member Guards Major Korzun at a seminar for crew commanders. Also interesting was a presentation by party member officer Lavrenkov at a meeting of subunit party activists. Subsequently, on the recommendation of the party committee, excellent-rated crews, utilizing their aircraft equipment, demonstrated their skill to the men of other subunits and told them how they had achieved efficiency in readying their fighters for training sorties.

[Question] Tell us, Gennadiy Stepanovich, how competition helps aviation personnel strengthen discipline and organization -- the foundation stone of flight operations safety.

[Answer] Guards Major Korzun's flight took first place in the last performance totals in Guards Lieutenant Colonel Bezlyudnyy's squadron. What did the squadron commander use as a guideline in determining the winners? This flight's aviators achieved unquestioned success, but others also did well. The pilots in Korzun's flight were learning to fly a modern aircraft which was new to them, and they were working on mastering many performance tasks for the first time. Now all the pilots do a sure job of flying this outstanding aircraft. The main thing is that during the entire period of training on the new aircraft and intensive flight operations in adverse weather conditions, none of them was involved in a near-accident situation. Here too firm discipline, organization, and party responsibility by the Communists for the assigned task were in evidence. In our regiment there are many flights and aircrews in which there have not been any violations of flying discipline for a long time and in which aviator training has been proceeding without accidents or near-accident situations. I shall note as self-criticism, however, that disorganization has not yet been completely eliminated some places in our regiment. It occurs most frequently wherever there lacks a genuine campaign for firm observance of regulations at the airfield and on the post, where indoctrination work is not in conformity with the demands of the June CPSU Central Committee Plenum. Frequently potential accident situations result from poor organization of flight operations, careless direction of flight operations, and departure from established rules and regulations. In my many years of Air Forces service I have come to the strong conclusion time and again that an air mishap rarely occurs suddenly and unexpectedly. Usually the conditions for it develop gradually; initially the pilot practiced a flight assignment with inexactitude on the simulator. He then was excessively casual in accepting the aircraft from his crewchief. He then proceeded arbitrarily to change altitude, failed to follow proper navigation fix procedures, and to fly too low. An inevitable conclusion suggests itself: lack of discipline on the part of flight personnel and loss of a sense of personal responsibility for each flight are the main reasons for violating safety procedures. As we know, accident-threatening situations are created through the fault of specific individuals. Both when totaling up competition results and in the process of all indoctrination work, however, we sometimes campaigned for flight operations safety only through the conduct of mass measures. This would mean scheduling meetings and conferences in the squadron, presenting lectures and discussions. Of course this work is

essential, and nobody denies its benefit. Their attention focused on mass measures, however, some commanders and political workers would at times lose sight of those who needed special attention. Implementing the decisions of the June (1983) CPSU Central Committee Plenum, we increased the demandingness of commanders pertaining to evaluating competition results and took pains to improve party-political work with aviation personnel. This helped further strengthen discipline and organization in aircrews, flights and squadrons, and helped increase combat readiness.

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ADVANCED LEARNING METHODS FOR PILOT CADETS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 22-23

[Article, published under the heading "Military Educational Institution Affairs," by Candidates of Military Sciences Lt Cols Yu. Kochegarov and Ye. Savvin: "Relying on Advanced Methods"]

[Text] At certain educational institutions the effectiveness of the learning process has not yet reached a level in conformity with today's requirements. One way to increase effectiveness is to adopt the problem method of teaching. There are specific features involved here. They were discussed in detail at a scientific-practical seminar at the Borisoglebsk Higher Military Aviation School for Pilots imeni V. P. Chkalov. Many of the opinions expressed at this seminar are in our opinion of interest to a broader audience.

It is no easy matter to develop a highly-educated ideologically-conditioned military pilot with highly-developed tactical thinking, capable of performing expertly in the most difficult modern combat situation. It is a matter, if one be permitted to express it in these terms, of resolving the conflict between the time allocated for his schooling and the steadily increasing volume of information which he should receive. As Candidate of Historical Sciences Col V. Martyshkin, head of the department of Marxism-Leninism, noted in his presentation, adoption of the problem method of teaching is dictated by the very innovative nature of the labor of future aviation commanders. The development of weaponry and increased combat capabilities of aircraft demand a continuous increase in efficiency of the teaching and learning process. And this means that the problem method of teaching is essential.

It would be incorrect, however, to utilize only the problem method in teaching. Officer cadets need a certain minimum of basic knowledge, and they acquire this knowledge in the process of information-presentation teaching. At first, when young people are just beginning the study of special subjects, the problems method is not always advisable. During this period it is important first and foremost to teach the officer cadets to work in a systematic manner. Success here depends in large measure on their attitude toward study and the depth of their interest in the subject being studied. Precisely-arranged monitoring and testing substantially increases the effectiveness of study. Devices toward this end include 10-15 minute written quizzes, knowledge testing

cards, and KISI-5 group testing machines. This makes it possible as a rule to test all cadets in a class.

Candidate of Military Sciences Lt Col E. Kokotek, head of the department of aerodynamics and dynamics of flight, stressed that particular attention is devoted to written quizzes in their department. While the first quizzes were difficult for the cadets, as the young men's thinking abilities develop, their answers become more logical and convincing. At first instructors seek to have the cadets view the content of a subject in the form of a system (complex) of interlinked elements. Then the topic items being studied will not be perceived by them as random and disconnected. Basic outlines of the structure of a subject can be used for this. This helps one more fully to understand it and to encompass an entire body of knowledge.

At the completion stage of the process of acquiring a minimum quantity of basic knowledge it is advisable to employ programed learning on the basis of diversified technical devices. They heighten interest in a subject and help form in cadets psychological readiness to take in a subject. And this has a positive effect on development of their intellectual capabilities and ensures good assimilation of the subject material. At the same time teaching devices are designed for the future pilots to respond according to a prior-conceived plan, that is, the student should receive a specific formula for actions in response to each situation. In connection with the fact that it is virtually impossible to predict in advance the situation in which he will find himself, the programed teaching method begins to hold back the effectiveness of the learning process, exhausting its potential, as it were.

It is essential to bear in mind that knowledge is amassed not only by the sum total of acquired information but also from the number of linkages existing between pieces of knowledge. The greater the number of these linkages, the easier it is to build up knowledge. This is easily traced in a response which requires reasoning of a cadet. The logic of the student's thought process provides the opportunity to test his ability to apply acquired knowledge in a practical situation, while the reasoning process proper helps form innovative thinking in him. In this case the problem method of learning helps students to solve problems, to classify and consolidate acquired knowledge.

Candidate of Philosophical Sciences Maj V. Cheban, deputy chairman of the department of Marxism-Leninism, noted that a problem situation does not always arise, but only in special conditions. The training material should be presented in such a manner that formulation of a question conforms to the students' intellectual and practical abilities. Otherwise they will fail to grasp the problem. The problems method of learning should conform to the knowledge amassed by the cadets. While their level of knowledge is lower in the first year of study, it reaches a maximum in the fourth. Therefore initially it is preferable to solve several problems against a general background of the explanatory-illustrative method.

The main thing which characterizes a problem is the designation of conflicts or contradictions, formulation of which does not enable cadets to find a ready answer in a book or lecture. At this stage it is important to stress constant

contact between instructors presenting lectures and instructors conducting seminar classes. It is advisable to employ teaching methods as an aggregate, continuously increasing the percentage share of the problem element.

Any learning situation which has been felicitously handled in one department may lose its novelty for another department due to exchange of impressions by the cadets of these departments. In view of this fact, after stating the problem, the instructor himself determines occurrence of the actual situation. If this did not work out, it is essential to find some other move. This means that an instructor should be armed with full knowledge and mobilized for a discussion so that a productive debate does not turn into a pointless conversation.

Candidate of Military Sciences Maj V. Kirichenko shared his experience in incorporation of the problems method of teaching. Under his supervision cadets analyze the operation of aircraft and electronic equipment systems with a simulator introducing malfunctions in a given unit or assembly. For example, in studying an aircraft automatic air intake cone control system, they proceed from a block diagram to a structural diagram, independently look for transfer functions, and investigate stability and quality of systems control. The main thing is to learn independently to analyze an experiment and formulate conclusions.

The head of the tactics department, Candidate of Military Sciences Col V. Simakov, stated that in studying air defense of the potential adversary, as a problem question they ask the cadets, for example, to determine that antiaircraft missile system element destruction of which will disrupt the operation of the entire system. Analyzing the situation, the cadet should picture the operation of the entire system, evaluate each system element, and isolate the most important component element. It is noteworthy that the department's instructors, from the very beginning of the lecture course, teach the cadets correctly to evaluate the air and tactical situation, estimate chances of reaching the defended installation, and teach them skills in making a decision to mount an airstrike. In other words, the students independently solve possible problems.

In practical teaching, instructors extensively use simulator displays to compute components of the wind triangle, actions in special flight situations, for weather analysis and in solving other problems. Problem situations are cranked into them, and monitoring equipment records the number of errors.

The problems teaching method is most fully utilized in consolidating test problems in aerodynamics, mathematics, and theoretical mechanics, as well as in writing a comprehensive term paper on tactics and combat employment of weapons. In this instance cadets use knowledge obtained in other subjects in preparing their paper.

The independent study method is also successfully utilized at our school. Particular importance is attached to papers dealing with flight safety. Officer cadet V. Kirilenko, for example, prepared a paper on the topic "Ensuring Safe Air Navigation in Mountain Areas," officer cadet V. Goncharenko -- "Ensuring Safe Aircraft Landings in Instrument Weather," and officer cadet

Yu. Nazarevskiy -- "Clouds and Their Influence on Flight Operations Safety."

A maximum-realism situation is reproduced in the cockpit simulator. It is advisable to create problem situations when practicing on the simulator. It is also beneficial to hone tactics of penetrating hostile air defense when the adversary is employing electronic warfare gear. In this case a problem situation can be caused both by transmission of information to the pilots from the instructor and by employing various simulation devices.

Reserve officers K. Kholodkov, Yu. Sytnik, V. Marenkov, and N. Korobov possess certain experience in cockpit simulator learning. Under the supervision of Hero of the Soviet Union Col (Ret) V. Yanitskiy, who has a great deal of flying and combat experience, they help students learn to make an intelligent decision in a developing situation.

Since higher schools constitute the basic stage in training highly-skilled aviation specialists capable of independently and innovatively solving problems connected with aviation activities, it is essential that the problems method of teaching be employed as extensively as possible at these educational institutions. Adoption of advanced learning methods will stimulate cadets to study on their own and will make it possible for them to develop flexible thinking and teach them to apply their knowledge and experience innovatively in difficult and sometimes unusual situations, in conditions where time is of the essence.

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IMPORTANCE OF PILOT HONESTY FOR FLIGHT SAFETY UNDERSCORED

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[Article, published under the heading "Constant Attention to Flight Safety," by military pilot-expert marksman Col S. Oskanov and Candidate of Medical Sciences Col Med Serv I. Alpatov: "Integrity Plus Oversight"]

[Text] At the present time it has been proven and is acknowledged by virtually everybody that mishap-free flight operations depend first and foremost on the human operator. Therefore the pilot should meet a number of tough requirements both in regard to his psychophysiological capabilities and personal ethical qualities.

Some of the most important demands on flight personnel include a high degree of discipline, follow-through, and integrity. They are grounded on a high level of conscientiousness and responsibility for performance of one's professional and party duty. A lack of discipline and a lack of integrity in aviation, where a great deal is grounded on faith and trust, are intolerable, since they greatly diminish combat readiness and sometimes lead to air mishaps and near-accident situations.

An aircrew was flying a performance-graded training mission at weather minimums. While on landing approach, after lowering his flaps the pilot did not feel the customary braking effect, and indicated airspeed remained unchanged. The aircraft began to rock from side to side, however. The pilot noted that the pitot heat switch was off. He realized that the pitot had iced up. The pilot throttled forward, switched on pitot heat, and informed the tower that he was going around. After landing, the pilot informed his immediate superior about the reason for the go-around. The incident was analyzed in detail with all personnel.

Honesty and truthfulness should be integral qualities of aviation personnel, to whom our people have entrusted expensive modern hardware. We shall discuss just a few, of course untypical cases of lack of discipline and integrity displayed by certain aircrew members, in order to show the potential consequences of this in flight operations.

Aircraft commander Capt V. Savin once made an error which came dangerously close to causing an air mishap. When the aircraft he was flying was at a height

of 250 meters above ground level, the tower controller ordered the pilot to abort the landing approach and proceed to the alternate field. Savin radioed that he was complying. but he continued his descent. At a height of 130 meters the tower repeated the order to proceed to the alternate field. But the pilot continued his descent. Only after he clipped a tree with his wing at a height of 10 meters (damaging a flap) did he proceed to the alternate field. It was ascertained during the inquiry following this incident that Captain Savin had violated flight operations discipline in the past.

Here is another incident. Aircraft commander Lt G. Vikhmyanin was on a daylight cross-country training flight in VFR weather. He descended to extremely low altitude without ATC clearance to do so. When the ATC controller requested his current altitude, he reported that it was as prescribed. Soon the helicopter struck some wires with its landing gear and sustained damage. Lieutenant Vikhmyanin had failed to carry out training flight instructions in the past as well. Unfortunately the command authorities did not find this out until after the incident described above.

Here is another example. Military pilot 1st class Capt A. Volkov was feeling quite confident during that flight operations shift. Perhaps it was excessive self-confidence which was his undoing. On his third training sortie that day he proceeded to execute a missile evasion maneuver with violations of his mission instructions. We should note that he was flying above featureless terrain. The pilot stopped paying attention to what he was doing for a few seconds, and the aircraft, dropping its nose, began to spiral downward. The aircraft was only a few meters from the ground when Volkov finally succeeded in bringing it to straight and level. Fortunately the incident ended without mishap.

Examining the flight recorder tape, the squadron commander noted unusual changes in parameters and asked Volkov if he had deviated from the mission instructions.

"But you know," the officer replied, "that I do not violate flight procedures."

"He doesn't do that kind of thing," the navigator spoke up for the pilot.

In fact, Volkov was described in his efficiency report as an exceptionally highly-disciplined officer. But a subsequent analysis of the flight recorder data indicated that he had deviated from the mission instructions repeatedly, as a result of which he had gotten into trouble. In addition, the pilot initially became confused and failed to respond immediately to the situation. If he had delayed a bit more, the incident could have ended in a serious accident.

As we see, officer Volkov had displayed a lack of integrity.

In military aviation mutual relations in the performance of job duties are built in large measure on trust. Nor could it be otherwise, since excellent moral-political, professional and ethical qualities are characteristic of Air Forces personnel. But at the same time one must not forget that constant monitoring, grounded primarily on objective data, is essential. Unfortunately aircraft commanders and pilots do not always promptly report incidents where they get into a difficult predicament due to their own mistakes.

Once an experienced pilot became spatially disoriented during an attack pass on an air target at night, in clouds. His fighter lost several thousand meters of altitude. He succeeded in recovering the aircraft from the dive at extremely low altitude, at very high speed and with excessive g-forces. The officer reported the incident to nobody. The near-catastrophe situation was determined from the flight recorder data after flight operations were completed. The reason for the spatial disorientation was the fact that the pilot had let his attention wander away from the gauges.

These facts indicate that certain pilots at times forget the laws on which aviation is grounded. Here we again approach the moral aspect of things, for no matter how sophisticated technical monitoring means may be, honesty and integrity are of paramount importance in multifaceted flying activities. It is very important to instill in each and every combat pilot a strong sense of personal responsibility for carrying out the flight assignment, a striving to analyze for himself the reasons for mistakes, and to teach the pilot to report his actions in the air without concealment. Increasing the effectiveness and quality of flight training depends on this to a considerable degree.

Here is another example. Prior to departure Lt I. Popov, going through procedures hastily, failed to turn on all circuit breaker switches, and his air navigation system failed during the flight. The pilot wanted to determine the cause of the malfunction for himself, but first it was necessary to report the situation to the flight operations officer. Popov did so. Almost immediately he was ordered to return to the base. As he was taxiing back to the ramp, the young pilot realized his error. When he climbed out of the cockpit, he forthrightly told the whole story to his flight commander.

They had Popov go through additional practice drills and simulator sessions. Now he no longer makes such mistakes. Let us imagine, however, if the officer had concealed his error, how things could have ended up. Of course the experts would have ultimately pinned down the cause, but this would have taken up a great deal of valuable time, and a lack of integrity could have only hindered the pilot's successful training progress.

Methods of self-appraisal of the quality of flight performance should be promptly reinforced with objective data. Considerable inaccuracies frequently occur with a subjective appraisal of flight performance, and at times they develop into gross errors which in flight lead to exceeding operating restrictions. At times such an approach engenders excessive self-assurance in pilots, which in turn suppresses a critical attitude toward the level of one's own job proficiency and, when a situation complication unexpectedly arises during flight, leads to confusion. This is why continuous monitoring and proper commander demandingness are so essential. It is precisely these which primarily make it possible promptly to reveal many instances of an immediate threat to flight operations safety. We should note that this work should be done in a particularly well-conceived and purposeful manner, since an adverse change in a pilot's mental or psychological state (self-confidence to confusion) is in general a weakness which is characteristic of most people. It is usually manifested when monitoring and oversight are diminished or when prompt and timely assistance is not forthcoming.

Young pilots in a certain unit, displaying lack of discipline and integrity, would switch off their rate of fuel consumption gauges prior to landing. Afraid of being blamed for causing a mishap-threatening situation, they would deprive themselves of the capability to monitor the amount of fuel remaining. Command personnel found out about this only by chance, when the engine of a taxiing aircraft shut down due to fuel exhaustion.

Today it is hardly likely that anybody doubts the fact that competent utilization of flight recorder data, even at the early stages of adoption of flight recorder devices, made it possible to prevent a considerable number of air mishaps and to avoid many problems in flight operations. Flight analysis is a highly complex process, which requires a thoughtful, innovative approach. The greater the quantity of various data a commander has on a pilot's flying technique, the better it is for all concerned. An objective, accurate appraisal of the quality of flight activities helps aviation personnel critically assess their achievements, facilitates air training, develops excellent moral-fighting qualities in them, and in the final analysis helps ensure flight safety. On the other hand, concealment of shortcomings and liberties in observance of established rules and regulations impede the development of combat pilots and in certain conditions cause accident-threatening situations. Monitoring and verification of execution are of enormous importance in indoctrination of military cadres. V. I. Lenin stated that a lack of verification of execution in military affairs is fraught with serious consequences: "While it is a failing common to all of us, in the military it is outright fatal."

We must seek to ensure that not one instance of failure to observe safety procedures in the air and that not one deviation from the rules and regulations of flight operations is ignored and fails to receive response on the part of commanders, party and Komsomol organizations. The main task here is to go deeply and comprehensively into the reasons for each and every deviation from procedure and to take effective measures to prevent them. One can scarcely exaggerate the role played by means of objective monitoring. Continuous indoctrination work with all categories of personnel, in combination with competent utilization of flight recorder data, will help commanders achieve excellent results in the training and indoctrination process and in ensuring flight safety.

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PILOT PARACHUTE TRAINING ANALYZED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 28-29

[Article, published under the heading "Flying and Psychology," by Col V. Fesenko, chief of the Air Forces Airborne Service, and Capt Med Serv A. Solomin "Possess Self-Control"]

[Text] In recent years units have been attaching great importance to personnel parachute training as an important means of developing psychological preparedness for intelligent and cool actions in emergency situations. Indeed, parachute jumping develops in aviation personnel emotional stability, boldness and resoluteness, the ability to act with precision when time is acutely of the essence, and reinforces such specific skills as coordination of movements in free fall, spatial orientation, etc.

Parachute training for flight personnel has its own specific features, dictated by the nature of activities of this category of aviation personnel. It differs from the parachute training of, let us say, airborne troops or DOSAAF sport jumpers. Pilots jump much less frequently, and this is understandable: parachute jumping is not of primary significance to combat pilots. As a consequence of this their attitude toward parachute jumping is sometimes, as they say, cool.

And this is far from the only reason. In the overwhelming majority of cases aviators use only a practice chute and, in addition, weather conditions during jumping, which are close to ideal, do not create additional difficulties. There are also differences in emotional perception. For most pilots and navigators parachute jumping is not a very pleasant activity. It is apparently not mere happenstance that there are comparatively few sport parachutists among pilots and navigators. During training for parachute jumping, some do everything they can to avoid what in their words is a "traumatic" activity. When you ask them how they will respond if circumstances demand, they usually give the standard reply: "When it becomes necessary, I will jump!"

But the main thing is not the actual jumping but rather the ability intelligently to estimate the situation and calmly to make a correct decision in that situation. But this is possible only if an aviator has confidence in his means of escape, in the reliability of his parachute. It is also an indisputable fact

that the more experienced he is as a parachute jumper, the greater his chances of not being injured in a jump.

As experience indicates, without developing in flight personnel the ability to self-appraise their emotional state and to adjust it in a rational manner, it is impossible to develop in them psychological readiness for intelligent actions in emergency situations.

Measures aimed at improving the psychological stability of a parachute jumper are for the most part of a preventive nature and are as a rule carried out long before parachute jumping commences. They include training classes conducted by commanders, political workers, physical training specialists, medical and airborne services, who to some degree attune personnel to the prospect of jumping, explain the significance of jumping and the substance of emotional manifestations during preparation for and execution of jumps. This increases people's confidence and does away with excessive tension. We should note that nervousness is an entirely natural state just before jumping out of an aircraft. It is also called prejump state. Three substates are differentiated: combat readiness, jump fever, and jump apathy.

Combat readiness is sometimes called a state of mobilization. This is an optimal emotional arousal, essential for a positive psychological jump effect on an individual and high-quality execution of all jump components. While waiting on the airfield to go up for a jump, the pulse beat of a pilot in such a state does not exceed 127% of the resting beat -- a rate of not more than 100 per minute.

Jump fever is an emotional arousal which exceeds the optimal. This is immediately apparent from the jumper's external appearance. He is fidgety, his face shows uneasiness, tension, and uncertainty, and there is almost always a blush or clearly-marked redness of face. An individual may miss or incorrectly perceive commands, but he himself asks a great many questions, often inappropriate ones. The pulse rate rises to 180% or more of the resting rate (exceeds 130 per minute). The breathing rate becomes faster, and is sometimes broken.

Jump apathy is characterized by insufficient emotional arousal in connection with the forthcoming jump, or even a depressed state. An individual shows a concealed or manifest disinclination to jump, although he recognizes the inevitability of the jump. His movements are languid, his facial expression stiff, and his face is often pale. Such jumpers stay aloof from their comrades, are rude or reply in monosyllables when spoken to. They may miss or incorrectly understand commands. Pulse frequently drops on the average to 77% of the resting rate (from 58 to 72 per minute).

It is important for every pilot to be familiar with his own individual normal pulse, in order consciously to overcome the negative effect of prejump states, especially jump apathy.

The ability to determine one's state prior to jumping is the basis for purposeful correction of one's emotional state, and consequently also for high-quality execution of a parachute jump. As such skill is developed, it becomes increasingly easier to control oneself in increasingly more complex situations.

One promising method of psychological self-teaching is autogenous conditioning, which consists of purposeful effort to influence the psychophysiological functions of one's own organism by means of autosuggestion. In other words, this is a method of self-monitoring and self-regulation, which in the future may become a component part of the intelligent awareness of the harmoniously developed individual. According to a survey, only 3 percent of pilots use self-drill to prepare for parachute jumping. The remainder have evidently not yet gained a real appreciation of this method, by mastering which one can achieve truly amazing results.

Medical personnel tested a group of pilots, enthusiastic practitioners of autogenous drill, both on the ground prior to jumping and in the aircraft immediately prior to the jump. Prior to boarding the aircraft, all were experiencing the "combat readiness" prejump state. Nobody sustained an injury or any other adverse consequences as a result of the jumps. In their own words, they take parachute jumping easily, with less neuropsychic stress than prior to employing the autoconditioning method. All of them accomplished a successful jump and maintained their good spirits. We shall cite some objective data on their physical state. Pulse rate 15 minutes before boarding the aircraft averaged 111 percent, 123 percent just before jumping, and 107 percent of base rate after jumping, upon arrival at the parachute donning point.

The pilots in a control group were tested at the same time. The following figures were obtained: 126, 146, and 122 percent at each point respectively. The result is obvious: those who have mastered autogenous conditioning endure negative emotional factors connected with parachute jumping at an optimal functional level, much more easily than those who do not practice this technique.

We can suggest one of the autogenous conditioning methods, developed by V. Marishchuk: the SKR (self-testing and self-regulation) system. It essentially consists of developing the habit of self-monitoring one's emotional state by the manifestations of emotions and forming of skills in correcting involuntary muscular tension, tightness, and disruptions of breathing rhythm (see table). It is expedient to utilize in cases when it is necessary to reduce neuropsychic tension.

Ask Yourself Questions	What should be Done
Is there occurring involuntary muscular tension? Are my movements tight or constrained? (Are my control efforts too abrupt?)	Relax arm and leg muscles, hold the controls lightly. Relax the muscles of the back, chest, neck, face. Assume the correct posture. Smile!
How am I sitting? What is my facial expression? (Am I pushed to the side of the cockpit, have I "hidden" my head in my shoulders, am I clamping my jaw?)	Breathe in deeply 2 or 3 times, expel breath fully. Establish a calm breathing rhythm with protracted exhalation.
How am I breathing? (Do I have irregular, superficial, faster breathing, involuntary stops in breathing?)	

Techniques of purposeful switching and concentration of attention during the separate phases of a parachute jump have proven quite effective as a supplement to the SKR system. For example, observing the specified jump interval, the jumpmaster always halts the next jumper. At this moment one should look at the jumpmaster's face. The calmness of this jump training expert will have a salutary effect. At the moment the jumpmaster gives the command to jump, one should switch attention to the horizon line. This virtually eliminates the possibility of the feeling of being at a great height. As one gains jumping experience, it is not necessary to switch attention to the line of the horizon. In this same situation it is recommended that one picture soaring flight after leaving the aircraft. This will prevent the unpleasant sensation that one is dropping like a rock. Prior to landing, aviators who rarely make parachute jumps frequently experience considerable neuropsychic agitation and, as a consequence, proceed incorrectly. Therefore prior to touchdown one must ask oneself questions pertaining to direction of drift and correctness of leg placement.

According to flight personnel and jump training experts, the suggested techniques greatly reduce nervous-emotional stress during jumps, and also decrease the number of errors.

Unquestionably the psychological attitude of flight personnel toward jump training is very important. One can obtain maximum benefit from jumping only when the creative efforts of pilots and specialists who organize and conduct jump activities are unified. And high quality of jump training is one of the components of the degree of job proficiency of every combat pilot.

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JOINT BULGARIAN-SOVIET EXERCISE DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) p 30

[Article, published under the heading "Visiting Our Fighting Friends," by Col M. Kalchev: "Final Examination"]

[Text] Joint exercises conducted by units and subunits of the Warsaw Pact member nations are of considerable military and political significance. The capabilities of our socialist armies to operate shoulder to shoulder, wing to wing against the common foe are demonstrated at such exercises, as is their growing combat power.

One such exercise, "Shchit-82" [Shield-82], in which subunits of the brother armies of the socialist countries took part, was held on the territory of the People's Republic of Bulgaria. The experience gained at this exercise forms a solid foundation for subsequent improvement of troop combat proficiency. Commanders and political workers are currently studying the exercise and adopting the acquired experience.

Soviet and Bulgarian aviators received good schooling in courage and skill at this exercise. One recalls the following incident. Reconnaissance aircraft led by military pilot 1st class S. Popov returned to the field from a mission. The intelligence they had obtained left no room for doubt: the "aggressor" intended to mount an amphibious landing. They could expect it at sunrise.

...The first light of dawn could be seen in the east. Fog hung over the vast expanse of smooth sea surface. The minutes of waiting slowly dragged on. The "aggressor" was a few kilometers from shore. The thick fog was his ally.

Suddenly the silhouettes of warships appeared on the horizon. A naval squadron of the opposing force was approaching the coast. Its objective was to put a landing force ashore and to seize a beachhead for subsequent operations by its forces.

The coast defense artillery remained silent. It was to swing into action later. At the moment it was the air forces' turn.

The aviators had been assigned a critical mission: to be the first to attack. Extreme precision and accuracy were demanded of them.

The missile-armed aircraft, led by military pilots 1st class officers Dachev and Dimitrov, reached their targets on schedule. The aircraft were flying low over the bay, and then climbed sharply.

Attack! The "aggressor" was stunned by the unexpectedness and accuracy of the strike. He was unable to undertake effective response actions; the aircraft flew several additional attack passes, and then disappeared as suddenly as they had appeared.

In spite of the "losses," the command authorities of the opposing force decided to regroup their forces and proceed with the landing. Several patrol craft sped to the attack. The coast artillery met them with a hail of fire.

Aircraft supported the naval squadron. Under the air cover they provided, the "aggressor" put tanks and armored personnel carriers ashore, which engaged without a pause. A fierce battle erupted on shore. The "aggressor" succeeded in capturing nearby high ground.

Combat aircraft, led by military pilots 1st class officers Dimitrov and Dikov, once again came to the assistance of the defending forces. They flashed over the battlefield, hitting the "aggressor" with rocket and cannon fire. His rate of advance slowed, and many weapon positions fell silent.

They flew another target run, another, and still another.... Coast artillery also delivered heavy fire.

At this moment "aggressor" fighters appeared overhead, aircraft which apparently had the mission of containing our strike aircraft. But these were alert to the threat. A specially designated group, under the command of military pilot 1st class officer Malchev, covered his comrades. Adroitly maneuvering, the combat pilots took an advantageous attack position.

An intense, dynamic engagement erupted. The pilots of the opposing forces fully demonstrated their skill. Malchev's pilots gained victory in hard-fought dog-fights. Their actions were distinguished by great precision and thorough planning.

Exploiting its air support, the defending force launched a massive counter-attack. The tankers and motorized riflemen pushed the "aggressor" back into the sea.

Fighters patrolled high overhead. They were providing reliable air cover to the attacking troops. Soviet and Bulgarian pilots were backing one another up. These class brothers -- brothers in arms -- successfully accomplished all assigned missions, demonstrating international unity and a high degree of combat skill in the course of the exercise.

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AIR TEAMWORK IN DELIVERING MOCK TACTICAL STRIKE

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 31-32

[Article, published under the heading "For a High Degree of Combat Readiness," by Maj A. Podolyan: "Anticipating a Strike"]

[Text] According to the exercise scenario, fighter-bombers would be the first to hit the "aggressor" missile positions. This would be followed by artillery preparation for the assault phase, with motorized riflemen advancing behind a moving barrage.

At first glance the airfield seemed deserted. There were no indications that it was an active field. Aircraft and special vehicles had been carefully camouflaged and concealed. Radar antennas sensitively probed the horizon. In the shelters work was in full swing around the combat aircraft. Engineers and technicians were readying them for a mission.

A businesslike atmosphere also prevailed at the command post. Each specialist was performing his job duties with precision. Compromises with realism were to be kept to a minimum at the exercise.

Lt Col A. Mikhaylov turned for the umpteenth time to a map marked with the tactical situation. It was rather complicated: the "aggressor" was strong and, judging from reconnaissance data, his combat dispositions were well protected by air defense weapons. One airfield was cause of particular concern. Were there fighters there or not? The commander did not possess such information at the time. It is true that aircrews were well prepared for the eventuality of fighter countermeasures from that "point." They had modeled several different versions of execution of the principal mission and had also rehearsed maneuvers to avoid a forced air engagement. But the "adversary" was equally well prepared. He also had been taught how to fight. What moves would he make? What new tactical devices would the fighter-bombers encounter?

Therining of a telephone broke into the commander's musings. Taking the receiver, Lieutenant Colonel Mikhaylov heard on the other end of the line the voice of the commanding officer of the fighter regiment: "Anatoliy Vladimirovich! Our pilots have spotted a group of interceptors at that 'point.' We must

assume that they will not make things easy for us. With the command's approval, I am sending out a group to hit the field. That is more convenient for us: the airfield is closer, and we have thoroughly studied the routes of approach -- there are gaps in the radar coverage."

"Thanks for the support!" Mikhaylov replied.

As it turned out, the "aggressor" had succeeded in landing undetected a flight of fighters at the field, planning to intercept the fighter-bombers which would be supporting ground troops. But his scheme failed. Air reconnaissance had done a fine job.

Mikhaylov felt a great burden slip from his shoulders. This was air teamwork and cooperation, genuine combat support! The neighboring unit was thinking not only of itself and its missions. Lieutenant Colonel Mikhaylov passed on the intelligence to the group leaders and ordered a radio set tuned to the fighter frequency. Some time later they heard the radioed commands of the pilots of the neighboring regiment who had taken off on the mission. Once again everything became quiet.

"They are doing a good job of concealment," Anatoliy Vladimirovich noted with satisfaction and glanced at his watch: departure time for the first group was drawing ever closer.

"Engineer, how is the equipment?" he queried the engineer command post.

"Everything is ready. We are waiting for your orders."

In the next minute the leader's voice boomed from the speakers of the radio set tuned to the fighter frequency: "This is 731, low cloud cover over the target area. Solid overcast.... Blowing in from the sea...."

"731, low cloud cover also approaching our field. Turn back. Land at neighboring field."

"Roger."

Once again the telephone rang at the fighter-bomber command post.

"Major Sabuk's flight is coming to your field. The target is entirely cloud-covered."

"We'll take care of them," replied Mikhaylov.

The engineer's concerned voice was heard on the local speaker: "Comrade commander! 40 minutes to departure, but aircraft from the neighboring unit will be arriving...."

"After they land, immediately ready their aircraft for departure. Assign your best ground crewmen. We are performing a common mission. Do the job!"

A few minutes later 4 fighters landed at the airfield. Missiles gleamed dully on their wing pylons.

"The stuff drifting in from the coast is not too bad," Maj V. Sabuk reported to Lieutenant Colonel Mikhaylov. "It will be gone in half an hour. The left edge of the cloud cover extends over the target. We can depart in about 20 minutes. There are 4 fighters in shelters at the target field. They must be 'locked in,' to make things easier for you. We shall hit them the minute the cloud cover breaks up. It is unlikely that the 'aggressor' will be expecting to be hit."

Evaluating the fighter squadron commander's proposal, Mikhaylov gave his approval.

"You take off first. They will ready your aircraft for you."

On the ramp ground crews were readying the neighboring regiment's aircraft for departure. If Sr Lt N. Marchuk, the flight's technical maintenance unit chief, were present, he would unquestionably be satisfied. The aircraft, which had been readied at their base by Sr Lt M. Baygulov, Sgt Yu. Vodin and others, were now also being serviced by experts. Maj V. Chistyakov, a squadron deputy commander for political affairs from the neighboring regiment, set the tone in the servicing procedures. He knew many of the men here. They had frequently worked together. And as we know, a solid military friendship helps things along.

When only a few minutes remained until fighter-bomber departure, Major Sabuk requested permission for his aircraft to take off. A few minutes later the fighters disappeared over the hills. According to calculations, they should reach the target as soon as the cloud cover broke up. Sealing off the "aggressor" field, the fighters would enable Lieutenant Colonel Mikhaylov's pilots to accomplish their mission.

Major Sabuk glanced at the horizon. The coniform mountains in this area rose to an elevation of 2,000 meters. Their taiga-covered tops seemed featureless, but this was only at first glance. The experienced pilot led his group toward the target with precision, keying off taiga roads and the occasional villages. Maj V. Chistyakov and Cpts A. Poplutin and V. Turovskiy kept in precise formation.

The group was now passing through a "blind spot" in the air defense. A swing left; the cloud cover began breaking up; another turn. After proceeding several seconds on the new heading, they spotted the "aggressor" field up ahead.

"Maneuver!" the leader ordered.

...They had arrived at the right moment. They hit the aircraft shelters with accuracy. The second 2-ship element also hit the target.

At this time the fighter-bombers took off. Proceeding at low level, taking concealment behind the hills, they reached the target area undetected and delivered a powerful, sure strike. On the return flight they were escorted by

the fighters, freed from their mission of sealing off the "aggressor" air-field.

The "engagement," which had ended just as suddenly as it had begun, was swift-moving and intense. At the debriefing, critique and performance summarization following the exercise, the higher commander highly praised the performance of the fighters and bombers, setting them forth as an example to the other aviators.

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FUTURE OF SATELLITE-BORNE ASTRONOMICAL TELESCOPES APPRAISED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 34-35

[Article, published under the heading "The Space Program Serving Science," by Yu. Zaytsev, department chief, USSR Academy of Sciences Institute of Space Research: "Telescopes in Space"; first of two parts]

[Text] The electromagnetic radiation which travels to us from celestial objects occupies a broad band of wavelengths -- from the very shortest, figured at thousandths of an angstrom (1 angstrom is equal 1 100-millionth of a centimeter), to the very longest, measuring kilometers. But only a small portion of these waves pass through the atmosphere. It passes, with considerable distortions, only "visible" (that is, perceived by the eye in the form of light) electromagnetic radiation and adjacent regions of the near-ultraviolet and infrared radiation. There is an additional "window" in the atmosphere, through which pass, reaching the Earth's surface, radio-frequency emissions from celestial bodies at wavelengths running from 1 millimeter to approximately 30 meters. The remaining frequencies are reflected, absorbed, and scattered by the ionosphere and atmosphere.

The space program has made it possible to convey scientific instruments beyond the Earth's atmosphere and to establish submillimeter, infrared, ultraviolet, X-ray, and gamma astronomy.

The first (other than the Sun) source of X-ray emissions in space was discovered in 1960, for example. Nine years later astronomers noted sources periodically altering their intensity of emission in fractions of a second. They were given the name radio pulsars. It was subsequently determined that these are rapidly rotating neutron stars, on the surface of which there are active regions directly emitting radio waves. Such a star is a unique rotating radio beacon. When its beam strikes the Earth, the observer sees flashes of radio emissions.

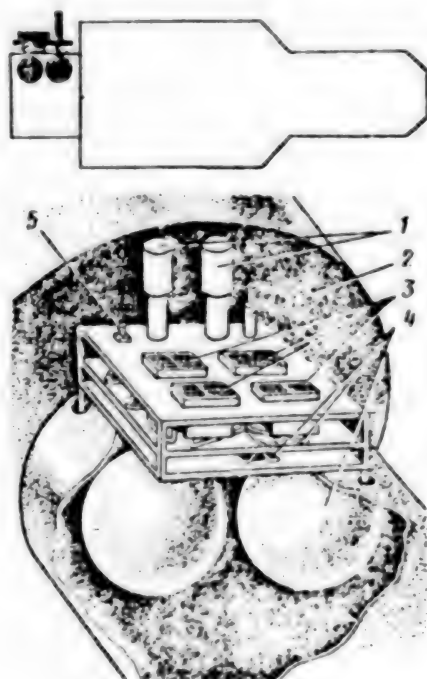
High-altitude aircraft and balloons ascending to an altitude of 20-40 kilometers can be used for investigations in the infrared and submillimeter regions of the spectrum. Ultraviolet astronomy requires that equipment be raised to altitudes of 200-300 kilometers. In the X-ray and gamma regions absorption of radiation by the atmosphere changes abruptly during transition from soft to hard radiation.

In the former instance altitudes of 100-200 kilometers are necessary for investigations, while in the latter instance it suffices to take equipment by balloon to an altitude of up to 40 kilometers.

The situation is different as regards the longwave region of the electromagnetic spectrum. The opacity of the atmosphere is connected with reflection of radio waves by the ionosphere, which extends to great heights. Depending on wavelength, required altitudes range from 1,000 to 10,000 kilometers or more.

At the initial stage of development of astronomy outside the Earth's atmosphere, scientists were looking for the possibility of building lightweight, portable telescopes which could be carried into space by the rockets and space hardware which existed at that time. They were not even similar to telescopes in the conventional meaning of the word, and they were accommodated on satellites designed to perform many other tasks.

Proportional photon counters were employed as emission detectors in X-ray telescopes, for example. The counter is filled with a gas mixture, in which the X-ray photon is absorbed, causing an electrical discharge. This is recorded by an electronic system. The discharge current pulse in these counters is proportional to the photon's energy. An X-ray telescope of this type ("Filin") was carried by the Salyut-4 orbital station (see figure).



Filin-2 X-ray Telescope

Key:

1. Star photometers
2. Lunar sensor
3. X-ray sensors

4. Gas-flow system
5. Solar sensor

This same orbital station also carried an RT-4 reflector X-ray telescope. It employed a parabolic mirror to focus X rays arriving from space onto the inlet window of the radiation detector -- a gas-discharge photon counter. In order to prevent rays not reflected by the mirror from striking the counter, a diaphragm was placed at its outer edge. Its annular aperture was closed by a helical collimator, which protected the counter from off-axis rays.

Satellites oriented on two axes can be used to survey the entire sky. Instruments aimed at the local zenith will scan the sky with an angular velocity of approximately 4° per second. The scanning circle in turn will be displaced several degrees every 24 hours by shifting of the orbit. Thus the entire sky can be surveyed in approximately 45 days in orbit. This system was used by many Kosmos-series satellites, which performed investigations in the field of gamma astronomy.

The most preferable, however, is a stellar astroorientation system. With such a system, telescopes can be aimed at any point in the celestial sphere. Telescope aiming systems which are autonomous of the satellite can also be employed. Such a system was used on the Salyut orbital station to control the Orion telescope (spectrograms of thousands of stars were obtained with its assistance). The control arrangement for the RT-4 X-ray telescope is somewhat different. Rough aiming was accomplished by orientation of the entire station, while precision pointing was accomplished with an independent telescope automatic control system.

On 23 March 1983 the Soviet Union launched the Astron automatic station. It carries a solar-stellar orientation system, which aims the station at the target source and stabilizes it with an accuracy of up to several minutes of angle during sensing sessions. In the ultraviolet band a special independent system holds a star on the spectrometer slit. The orientation system can provide observations in scanning mode while the Astron is turning on an axis pointed to the Sun. Stabilization of rotational velocity equal to one half a degree per second is provided.

In the future there will be a need for systems which guarantee a specified orientation with an accuracy in the order of hundredths of a second of arc. Of course designing and building such systems will require totally new technical principles and engineering solutions. Within the next decade, however, it will be possible to put into earth orbit a telescope with a mirror diameter of several meters, for observations in the optical, ultraviolet, infrared, and submillimeter bands. With an aiming accuracy and stabilization precision of approximately one thousandth of a second and a resolution of a hundredth of a second, such a telescope will make it possible to investigate in the optical band faint objects down to a magnitude of 28-30, that is, 100 times fainter than can currently be observed in the world's largest terrestrial-based telescopes. The dimensions of the observable universe will increase 60-fold, and its volume will increase 1,000 times. Objects the existence of which we can only surmise will become accessible to investigation.

Unquestionably such an instrument will enable us to make interesting discoveries and findings. For example, it will enable us to discover new objects in the solar system, including thousands of asteroids, and to determine their dimensions and reflective properties. Such a telescope will also be used to search for new planets in the solar system, including a conjectured 10th planet beyond the orbits of Neptune and Pluto. It will also enable us to discover planetary systems around nearby stars, to determine the curvature of space in the Metagalaxy on the basis of observations of distant galaxies, and to solve many other problems. Nevertheless spectral and photometric investigations in the ultraviolet, infrared, and submillimeter regions of the spectrum will evidently become the main task of future observatories outside the Earth's atmosphere. (To be concluded)

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PATIENCE IMPORTANT IN TRAINING NOVICE PILOTS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 36-38

[Article by S. Lisitskiy: "Two Encounters: A True Story"]

[Text] Lieutenant Colonel Royenko rose early that morning. This was his first trip as a pilot-inspector since his reassignment from another military district, and he felt the desire to get to work immediately. Engineer-Lieutenant Colonel Yeliseyev, with whom he had arrived in the aviation combined unit the previous evening, was still sleeping. Petr Akimovich walked gingerly out of the room, endeavoring to keep the floor from creaking. He did his morning calisthenics routine on the little plaza in front of the hotel. A few minutes of vigorous calisthenics and a short run along the tree-lined paths made him wide awake and filled with energy. He returned to the hotel, washed up, and walked into the room with a bath towel over his shoulder. Seeing that Yeliseyev was now awake, he shouted from the doorway: "Up 'n at 'em!"

Straightening up with a jerk, Yeliseyev rose from the bed.

"At your command, sir!"

"Ready for action!" said Royenko with a smile, and switched on his electric razor.

"Yessir!" the engineer replied in like bantering tone and proceeded to make himself ready.

As he was shaving, Petr Akimovich thought about the day's agenda. First he would meet with the regimental commander and his deputies, after which he would proceed to going into all the details -- examining documentation, checking progress in combat training, plan fulfillment, and accompanying the younger pilots on scheduled check rides. Gorobets -- he recalled the regimental commander's last name, which he had heard mentioned yesterday at division headquarters. A familiar name!

...When Royenko was a pilot-instructor at flight school, he had had a pilot cadet by the name of Ivan Gorobets. And he had had plenty of grief with him! In general Gorobets made a fair impression in the first year: hardworking,

thoughtful, serious, and he had done a good job of mastering theory. But when they commenced the dual flight instruction, he became as if a different person. He became timid, constrained in his actions, and became confused in the trainer cockpit. The other cadets in his section had already soloed, but Ivan continued to need dual time. And people began to wonder when he would catch up with his comrades. Finally Gorobets did solo, although behind schedule. Even after this, however, things did not improve. The cadet followed one accident-threatening situation with another, more serious one. Lieutenant Royenko was becoming increasingly inclined to the conclusion that his student was not cut out to be a pilot. For the sake of the cadet's feelings, he held back on saying anything about it to him, but he did once mention the problem to the commanding officer of the aviation training regiment.

"Wash him out?" the commanding officer pondered. "Is your conclusion not a bit hasty? After all, a person's entire future is at stake. Think the matter over carefully. I don't believe that Gorobets is hopeless as a future pilot. Perhaps your method is lacking? It is easy to wash out, more difficult to get through with instruction. There is food for thought here...."

Petr could feel that he was blushing. Did the commanding officer think that he, a young instructor, was afraid of difficulties and had decided to get rid of a cadet who was not working out well? No, he was sincerely convinced that Gorobets would not make a decent pilot. It was better to wash him out now than later. This would save both him and his superiors from mental anguish....

The decision on washing out Gorobets was postponed. Royenko silently heard out advice to take a closer look at the student pilot, to determine the reasons for his setbacks, and to help him surmount the psychological barrier. In short, he was to find an approach to this young man, to find the right key. He heard them out, but deep down inside he could not agree with them. Well, if necessary he would continue working with Gorobets, but would anything come of it?

Royenko was unable to say for sure whether he had succeeded in finding the key. It is more likely that Gorobets himself found his own weak points and determined a way to overcome them. Some time passed, and things gradually began to improve. It is true that he continued to remain in the middle of the pack right up to his graduation, but he no longer fell apart in the air.... "You look sad, Petr Akimovich," commented Yeliseyev, returning from the washroom. "Sad? Not at all. I am a bit nervous! This is my first such inspection assignment. How will it go?"

"It should go fine. You are serious about your job, and that is the main thing."

Yeliseyev had been visiting aviation garrisons for several years now, had gotten to know things, knew the people, people knew him, and it was not particularly difficult for him to check aviation engineer service performance. This time he was to determine the degree to which a fighter had been damaged by a pilot and to assist in making repairs.

Royenko absently watched Yeliseyev get dressed, but his thoughts were far away, at district Air Forces headquarters. The directorate chief, realizing that the

inexperienced inspector would encounter a great many problems, summoned him to his office on the eve of departure and gave him a detailed briefing.

"I understand what you are feeling, Petr Akimovich," he stated in conclusion. "You probably want to encompass everything on your first line-unit inspection trip. But you must realize that it is impossible to encompass the unencompassable. My advice is to choose one major item, such as efforts aimed at boosting the proficiency rating of flight personnel, for example, and thoroughly examine that specific area. Through this prism you can examine the figures on accomplishing the scheduled number of flight hours logged in VFR and IFR weather, training hour effectiveness, etc. A great deal will open up for you. The main thing is not to scatter your efforts. Life is a complicated business. It can toss up a great many secondary issues. You cannot accomplish everything on a single inspection visit. You would do better to take note of them and deal with them at a later time, when you are well prepared."

...After breakfast the officers set out for headquarters. It was not that long ago when Royenko had been a lieutenant and a pilot-instructor at aviation school, and here he was a lieutenant colonel and a pilot-inspector. He was empowered to check and teach others, and to help them. Yes, that is the way his career had gone! Upon graduating from the Air Force Academy, for several years he had commanded a squadron and served as a regimental deputy commander. He had served at a great many garrisons. He had seen a variety of individuals and had amassed flying experience and experience in life. And now he had a new and responsible job. The command authorities likely viewed him as a person capable of an inspector's job. But he had to prove it with deeds!

They parted company at regimental headquarters. Yelisseyev headed for the deputy commander for aviation engineer service, while Royenko went to see the commanding officer. When he entered the office a lieutenant colonel of modest stature, with a round, open face and a small, slightly turned-up nose, rose from behind a green cloth-covered desk. Lively, animated gray eyes, with a cheerful, even mischievous expression on his face. Royenko stiffened in surprise: it was him! Lieutenant Colonel Gorobets also became flustered.

"Ivan Nikitovich?" Royenko asked to make sure.

"That's right, comrade lieutenant colonel!" Gorobets smiled.

"What a surprise!"

"I must admit that I too did not expect to encounter you in my regiment. I had heard that a Royenko had been appointed a new pilot-inspector. I wondered if it could be the same one."

They walked toward one another as they talked, and embraced. When the initial emotion of the encounter had subsided and they sat down by the desk, they could not keep from reminiscing. In general Gorobets's career had gone well. A year after graduation he had been designated senior pilot, and flight commander 2 years later. This was followed by the academy. After the academy he had served 2 years as a squadron commander, and then had done a tour of duty with the

limited Soviet forces in Afghanistan. And now he was a regimental commander.

"Congratulations!" said Royenko, sincerely pleased with his former student.

"Thank you. How do you like our post?"

"Excellent! Quiet and clean. A beautiful river."

"Definitely visit the park. It was laid out in the time of Peter the Great. It contains 300-year-old oaks, elms, and lindens...."

"I'll do that later if I have time. Most important, I have business in the regiment."

"Of course...."

Lieutenant Colonel Royenko was extremely busy all day. Flight operations were scheduled for tomorrow's first duty shift, and preliminary preparations had to be made. He checked the combat training scheduling, the record of plan target fulfillment, looked through the flight documentation, met with people, and discussed in detail a great many items. He was tired as he returned to the hotel that evening. Soon Yeliseyev appeared. He was quite upset. It seems that a pilot, either out of inexperience or ignorance -- the authorities could make that determination -- had damaged a new fighter: he had made a hard 3-point landing, had proceeded to porpoise and had wiped out the nose gear.

"People like that should be grounded permanently instead of being entrusted with expensive equipment," the engineer uttered indignantly.

"Why so severe?" Royenko disagreed. "Maybe it was not the pilot's fault?"

"Of course it was! His name is Panin. This is not the first time he has done something like this. I heard quite a bit about him today.... This pilot is slated to be grounded permanently."

The inspection tour was about over when Royenko once again entered division headquarters: it was necessary to clear up something. Sharing his impressions with the division commander, Petr Akimovich inquired about the fate of Senior Lieutenant Panin.

"We have had real problems with this pilot," sighed the division commander.

"He regularly makes gross errors in flying technique. They have held additional training classes and practice sessions with him. Nothing helps.

Gorobets has made the decision to ground him. Here, read his report. With reference to the methods council's recommendations, he requests that Panin be transferred to a ground assignment."

The colonel handed him the regimental commander's report. Royenko proceeded to read it carefully.

"It would seem that everything here is convincing and well substantiated," stated the division commander, receiving back the report. "The regimental senior officers are of a unanimous opinion: Panin will never make a real fighter pilot. The final decision has not yet been made, however. I have personally spoken with Panin. Prior to training into what for him was a new fighter, he was considered a pretty fair pilot. Even a bold, determined pilot. And then suddenly everything started to go wrong. He recently almost smashed up a fighter. What do you think we should do with him?"

"I have a few days left. I would like to become acquainted with Panin. Do you have any objection?" Royenko asked.

"Of course not? Go ahead."

When Lieutenant Colonel Gorobets learned of the conversation between the inspector and the division commander, he became unexpectedly upset.

"There is no need for you to concern yourself with Panin," the regimental commander uttered with excessive haste. "It is an internal matter. We shall handle it ourselves."

Royenko recalled the directorate chief's advice not to get involved in matters which did not pertain to the purpose of the inspection visit. Nobody was making him deal with the Panin business; what's more, they were trying to dissuade him. But he felt that he could not, did not have the right to remain indifferent to a pilot's fate. At the very least he should determine what the problem was. Otherwise he could not set his mind at rest.

"Ivan Nikitovich! The day after tomorrow flight operations are scheduled in your regiment. Please schedule a couple of dual training flights for me and Panin. I want to determine what he is capable of."

"As you wish," Gorobets reluctantly assented. "I am just afraid that your efforts are in vain. In addition, the matter can be considered virtually settled. Panin has agreed to a ground assignment. We have selected a good job for him -- he will be a regimental tactical control officer. This suits him just fine."

That evening Royenko went to the hotel to see Lieutenant Panin. The latter had just come off duty. He became confused and embarrassed upon seeing the visiting lieutenant colonel in the doorway.

"Well, why do you look so dejected?" Petr Akimovich gazed intently at him and smiled. "Let's go for a little walk."

They strolled along the bank of a placid stream toward a small backwater. Royenko could feel Panin's searching glances: just what did this pilot-inspector have in mind? The lieutenant colonel was in no hurry to bring up the subject of his setbacks. He praised the natural beauty of the area and talked about how strange fate was, bringing him this unexpected encounter with his former student. He then asked Panin to relate to him what had happened.

The pilot admitted that he believed that the high-performance aircraft to which he was transitioning exceeded his physical capabilities. He had the same rate of response to situation changes as previously, but with the new aircraft it was necessary to respond faster. He was unable to do so. Gorobets, impatient and rigid in his demandingness, having promised the higher command authority to retrain the entire regiment in short order, was extremely annoyed at his slow progress. Once he even angrily exclaimed: "You wonder about the reason for this attitude toward you? You have made the wrong choice of profession, comrade senior lieutenant."

"Well, what do you think?" Royenko asked.

"At that point I gave up. Before that I had had hope, but now I am willing to take a ground assignment. Maybe I am indeed not in my right place."

Royenko was pleased with his conversation with the young pilot.

On the flight operations day they flew the dual trainer to the practice area. Panin indeed flew the aircraft in a tentative manner. He was either very nervous or lacked experience. Perhaps another factor was the length of time since he had been up. He was extremely cautious and tense on the landing approach, and came close to fouling it up. Approximately the same thing was repeated the second time up. Lieutenant Colonel Royenko realized the main thing, however: he should not be driven out of aviation (he recalled Yeliseyev's words), but should be taught. And he should be taught thoughtfully and patiently! Panin required greater attention than the others. He had been given up as a lost cause. Their reasoning was that it would be simpler to take a new young pilot fresh out of school in the fall than to bother with Panin.

That same day, encountering the regimental commander in the pilot lounge shack, Royenko told him his impressions.

"You say we should not draw hasty conclusions?" Gorobets came back. "How much time can we waste on him? I have to meet the plan target, not mark time."

"The plan? But we are speaking here about a pilot's fate, his future!" retorted Royenko. "When I was an instructor at aviation school we had the following case. There was this pilot cadet, really bad. I was firmly convinced that he had absolutely no future as a pilot. As far as I was concerned there did not exist the question of teach or wash out. It was only wash out! But my older and more experienced comrades kept me from making a hasty decision. I had to spend a great deal of time working this cadet. He graduated and became a pilot."

"A bad decision!" said Gorobets. "It is unlikely he ever amounted to anything. Probably his superiors are still having trouble with him."

"I don't think so. Subsequently that cadet found himself and showed what he was capable of. He even became a regimental commander, and a firm, strong-willed, resolute commander."

"Just who is he, if I may ask?"

"He is you, Ivan Nikitovich! At the time your continued presence at the school was greatly in question. Only we didn't tell you about it. It was premature. And subsequently there was no need. We saved you as a pilot."

...Several years passed. Royenko and his family were passing through Moscow on leave. At the Belorussian Station somebody hailed him by first name and patronymic. He turned around. A tall, well-built captain in full dress uniform stood before him.

"Don't you recognize me, comrade colonel?" he asked.

"Aren't you Panin?"

"That's right!" the officer beamed.

"Where are you stationed now? How are things going?"

"A year ago I was assigned to a tour of duty with a group of forces. I was a senior pilot. I am now a flight commander. Things are going just fine."

"I am happy for you. Very happy. Thank you for justifying my trust."

"It is I who thank you. I often think of you. I owe you a great deal. It embarrasses me to think about it: I had agreed to a ground assignment. I can't even imagine life without flying!"

Petr Akimovich was standing by the window, gazing absently at the green fields and woods passing by. He thought to himself: "How important it is to believe in a person!"

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SOVIETS STATE CASE AGAINST KAL 747

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) p 39

[Article, published under the heading "Aviator, Be Vigilant!": "In the Heat of Anti-Sovietism"]

[Text] The anti-Soviet hysteria raised by the U.S. Government around the fact of intrusion into Soviet airspace during the night of 1 September 1983 by a South Korean Boeing 747 is continuing to have effects. The organizers of this filthy act of provocation openly attempted to gain political capital from it and were quite willing to stoop to shameless attempts to profit from this human tragedy. Just what is the White House seeking to gain from the campaign of slander it unleashed? Its aim is obvious: to expand and deepen the battlefront of the notorious "crusade" against socialism, to whip up a new wave of anti-Sovietism and anticommunism, and to cast a shadow on the peace-seeking foreign policy of the Soviet Union.

It is a well-known fact that political methods are closely in line with policy. The present Washington Administration has proclaimed its credo: peace on the basis of force. This signifies not maintaining good-neighbor relations with other countries, not respecting the sovereignty of countries with a different social system, but crude military intervention, economic pressure, acts of ideological sabotage, political blackmail, and outright terror tactics. Thus the provocation involving the South Korean aircraft is a link in the overall chain of filthy acts of provocation which pursue the aim of impeding normalization of relations between East and West.

Planning this criminal action, its authors reasoned as follows: if the spy plane succeeded in overflying Soviet territory unchallenged, it would provide the Pentagon with information of intelligence interest. And nobody would be the wiser. The organizers of this act of provocation also foresaw another possible outcome, objectively proceeding from the actions taken by a sovereign nation against a border intruder: if the aircraft were to be shot down, they could launch a new wave of anti-Soviet slander and insinuations.

No matter how much the provocateurs attempt to justify their actions and to conceal the truth, the logic of cold, hard facts inexorably exposes them. Their lying and slanderous anti-Soviet statements were fully exposed in an official statement by the Soviet Government as well as at a press conference held in Moscow by the USSR Ministry of Defense and Ministry of Foreign Affairs. It has been absolutely and irrefutably established, for example, that on 31 August, just prior to the South Korean aircraft's intrusion into Soviet airspace, seven flights by U.S. RC-135 reconnaissance aircraft were recorded in that area. That same day a reconnaissance aircraft of that type was observed maneuvering for a period of 3 hours, at an altitude of 8,000 meters, in the immediate vicinity of the point of intrusion into Soviet airspace by the South Korean aircraft. At the same time three U.S. naval ships appeared in the vicinity of Soviet territorial waters. At 0441 hours Kamchatka time, on 1 September, a second aircraft with a radar signature similar to that of the RC-135 appeared in the area in which the reconnaissance aircraft was patrolling. The two aircraft moved closer together until their blips on the radarscope totally merged; one of them then proceeded on a heading toward Alaska, and the other headed for Petropavlovsk-Kamchatskiy. Soviet air traffic control tried to establish communications with the aircraft in order to inform it of its airspace violation. It failed to respond, however, and continued on that same course, penetrating deeper into our airspace.

Soviet military aircraft were sent up to identify and assist the intruding aircraft. The intruder failed to respond to their commands, continuing to fly without navigation lights. It was deliberately following a course to overfly important Soviet military installations located on Kamchatka. At the same time it was transmitting brief encoded signals, which are customarily employed in intelligence transmissions.

As the intruder was approaching Sakhalin, Soviet aircraft once again tried to establish contact with it and escort it to the closest Soviet airfield. Attempts were made to establish communication with it on the international emergency frequency. The intruder, however, proceeded to alter heading and altitude in an evasive maneuver, employing in particular a technique used by RC-135 aircraft during similar encounters with air defense fighters: it lowered its flaps and proceeded to lose airspeed. The purpose of this was to get the Soviet military aircraft to overrun it. This device failed: our pilots are too familiar with the habits of the aerial spies. The intruder then sped up. Sharply altering his course, he avoided Soviet antiaircraft missile unit positions and proceeded to overfly important military installations located on Sakhalin. All this left no doubt about the fact that the flight was for intelligence purposes.

One more attempt was made to get the intruder aircraft to land: a Soviet interceptor fired four warning bursts of cannon tracer rounds. They were clearly visible in the still night-dark sky. Once again the spyplane refused to comply, instead attempting to flee, heading toward Vladivostok. At that point an order was given, and the flight was terminated.

There is reason to assert that an E-3A (AWACS) aircraft, which was monitoring the flight both of the intruder aircraft and our fighters, was operating in the area in which the intrusion into Soviet airspace took place. In addition, one is struck by the precise time coincidence between the flight of the South Korean Boeing and an orbital pass by a U.S. Ferret D reconnaissance satellite, which was recording the operation of our air defense radar facilities both in their normal, routine operations and during the time they detected the intruder aircraft.

Against these facts, attempts by the U.S. Government to make it appear that the USSR "attacked" an innocently errant civilian passenger aircraft look ridiculous. Thousands of foreign aircraft fly in Soviet airspace, and their safety has always been guaranteed -- for they are on peaceful business. But he who intrudes into our airspace on an espionage mission cannot count on getting off scot-free. A convincing example of this is the mission of the U.S. U-2 reconnaissance aircraft. Incidentally, then as well brazen imperialist circles proceeded to whip up an anti-Soviet slander campaign. But incontrovertible evidence and proof forced them to admit that the spyplane's actions had been deliberate.

In recent years intrusions by U.S. aircraft into Soviet airspace, figuring on getting away with it, have occurred on a regular basis. This year alone there were 12 such intrusions, including on 4 April by four carrier-based aircraft from the "Midway" and "Enterprise," with the ensuing official Soviet protests ignored. On the contrary: provocational actions by U.S. aircraft have increased in frequency. There is information indicating that the U.S. intelligence services have begun utilizing civilian aircraft for intelligence purposes to an ever increasing degree, and not only U.S. aircraft but also those of other countries, including South Korea.

Evading direct answers and making every effort to conceal the truth, the Washington Administration is attempting to foist upon the world community a notion of the "brutality of the perpetrated action." But did the Soviet side not do everything it could to avoid taking extreme measures? The air boundaries of the Soviet Union were established by the USSR Law on the State Borders and are defined strictly in conformity with standards of international law. The intruder aircraft was in flagrant disregard of this law, and could have been shot down, with certitude and at any time, by anti-aircraft missiles while it was still over Kamchatka. The Soviet side displayed extreme restraint, however.

Soviet leaders have expressed regret in connection with the loss of life. At the same time we resolutely condemn those who permitted this loss of life and are now exploiting the incident in order to whip up anti-Soviet hysteria and escalate international tension.

"Imperialism has become entangled in its own internal and intergovernmental antagonisms, upheavals, and conflicts," stressed the June (1983) CPSU Central Committee Plenum. "...There has been a sharp increase in the aggressiveness of ultrareactionary forces, led by U.S. imperialism." Such a policy cannot produce success, but by its adventurism it is extremely dangerous to mankind. In order to prolong its existence, imperialism is willing to make any sacrifices and

commit any acts of provocation, such as the criminal action involving the South Korean aircraft. All this places on the fighting men of our Armed Forces and on Soviet aviators great responsibility for maintaining a high level of combat readiness and calls upon them to increase their vigilance to an even greater degree, in order to be prepared at all times to repulse provocateurs and aggressors.

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COSMONAUT SURVIVAL TRAINING DESCRIBED

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[Article, published under the heading "Cosmonaut Training," by I. Davydov and Candidate of Technical Sciences I. Pochkayev: "On Land and on Sea"]

[Text] The spacecraft, plunging into the Earth's atmosphere, began to decelerate. There was an abrupt jerk. Parachute deployment was occurring. A few minutes later the cosmonauts felt an impact and heard the cracking sound of trees splitting. They tried to open the entrance hatch, but something was blocking it. They finally succeeded in pushing the hatch cover open. The interior of the craft was flooded with light. It was very bright. Cold air also entered the open hatch. It was more than 20° below zero Celsius.

The cosmonauts climbed out of the spacecraft and immediately sank in snow to their waists. It seems that the entrance hatch had been pinned by a birch trunk. The craft was surrounded by tall trees. A parachute hung from the smashed top of one of the birches. They were surrounded by impenetrable taiga.

They had been forced to make an unscheduled landing in this area. Pavel Belyayev and Aleksey Leonov would have to hold out until a search and rescue party reached the site. They checked to make sure that the Komar homing transmitter was in good working order and operating in "Beacon" mode. Everything was fine, and they would certainly be rescued. It was only a matter of time.

The cosmonauts took the NAZ (portable survival kit) out of the spacecraft, which contained food, water, and emergency items. They attempted to move through the deep snow, but they tired rapidly. It was necessary to conserve their strength, because they did not know when rescuers would arrive. Nor were they able to get a campfire started in the deep snow: there was no dry fuel.

Soon a helicopter appeared over the landing site. But assistance did not come immediately: the airdropped packs of clothing and food either got hung up in the treetops or fell to the ground so far from the spacecraft that they could not reach them through the deep snow. The cosmonauts were quite cold and hungry by the time the rescue party reached them. They also had to make their way to the helicopter landing site on skis, across windthrow and snowdrifts.

This mission confirmed the need comprehensively to train cosmonauts in survival procedures for a forced landing situation in any and all climatic-geographic conditions. This mission served as a stimulus toward further development of appropriate methods.

A team of experts and test personnel was instructed to determine the minimum requisite supply of water, food, and special clothing in order to survive a maximum amount of time in extreme weather conditions in various environments: in a searing desert, with sandstorms and temperatures reaching $+50^{\circ}\text{C}$; on the steppe and on the tundra, in winter during a snowstorm, blizzard, temperatures as low as -50°C with winds gusting to 25 m/s; on mountain terrain at an elevation of 3,500 meters, in conditions of hypoxia, abrupt weather changes and sharp differences between day and night temperatures; in areas with high humidity and high temperatures, aggressive flora and fauna. Particular attention was devoted to sea and ocean splashdowns in heavy seas and at various water temperatures. The cosmonaut might find himself not only inside but outside the spacecraft as well.

Performance of these tests required thorough preparation of specialists and gear, as well as great courage and fortitude on the part of those persons who were consciously facing extreme effects of the environment on the human organism.

This difficult work resulted in the formulation of experimentally verified methods, in which fundamental objectives were stated in a clear and well-substantiated manner: psychological preparation of a spacecraft crew for the eventuality of a forced landing on uninhabited, inaccessible terrain, maintaining a person's fitness in conditions of extreme actions on the organism by adverse environmental factors, acquisition of skills in operating spacecraft systems which are operable following a landing, and in working with improvised means and field-expedient materials. Personnel also rehearsed teamwork and coordination between cosmonaut and search-rescue parties.

A specialized simulator -- a Soyuz reentry capsule with systems operating up to the moment of touchdown -- was designed and built to train crews to operate in a forced-landing emergency.

Cosmonauts would be flown by airplane or helicopter to the field training area, where they would be broken up into groups, consisting of regular-assigned or arbitrarily-determined crews. They would then proceed with the training mission. Conditions of survival training maximally approximated extreme possible conditions for the given climatic zone.

For example, a helicopter or a special all-terrain vehicle would carry the reentry capsule deep into the desert. The cosmonauts, wearing pressure suits, would ride inside the spacecraft. The parachute canopy with which the craft "had returned" to Earth would be spread out on the dunes. The cosmonauts, carrying a limited supply of drinking water (2 liters per man), would spend 48 hours in the desert, where the air temperature would reach $+50^{\circ}\text{C}$, and the sand surface temperature -- $+75^{\circ}\text{C}$. It was an extremely difficult mission, but they had trained for it in advance. Instructors and medical staff, utilizing prior-amassed experience in desert survival, taught them how to fashion a shelter

out of a parachute, sand and other materials at hand, how to economize on water, how to move efficiently across sand, and how to use clothing in order to avoid heatstroke and retain moisture in the organism. Such training drills teach one composure and self-control, teach fortitude to resist adverse conditions, and unify a group. Everybody is aware that success depends on mutual assistance and mutual understanding.

Once Anatoliy Berezovoy decided to put himself to a unique test. He walked beyond a dune, so that he could not see his comrades taking part in the exercise. He later told his instructor about a feeling of crushing loneliness, which inhibits the actions of a person who is not prepared for unusual impressions, and about how much more easily one can endure such a feeling when one is in a group, with friends.

One might state that what happened to P. Belyayev and A. Leonov may never again occur. But the experience of the manned space program has confirmed the correctness of the decision to devise methods of training cosmonauts for survival in extreme conditions. A. Gubarev and G. Grechko, V. Gorbatko and Yu. Glazkov made a landing onto the steppe in a snowstorm. The spacecraft carrying V. Lazarev and O. Makarov hung suspended on the edge of a precipice following an emergency landing on mountain terrain. B. Volynov and V. Zholobov used a radio to guide helicopters to their location on the steppe at night. And the final phase of the manned mission flown by V. Zudov and V. Rozhdestvenskiy was particularly difficult. On a cold winter night, in fog and during a snowfall, they splashed down onto the half-frozen Lake Tengiz. In addition, the wind on the lake had whipped up waves consisting of water and slush ice. In these exceptionally difficult conditions, in spite of incredible efforts on the part of the search and rescue team, they were unable to recover the cosmonauts before morning.

As we know, almost three fourths of the Earth's surface is covered by water. As practical experience demonstrated (in particular, the landing by Zudov and Rozhdestvenskiy), water cannot always be avoided. Therefore crews are also taught water landing procedures at the Cosmonaut Training Center. This training is initially conducted at the hydrolaboratory at the Center, and subsequently in lakes and on the sea. These training activities are perhaps the most difficult. Nikolay Rukavishnikov, who had taken part in water landing training on numerous occasions, once said: "In my opinion these drills are reminiscent of space flight in their emotional and physical stress load. They demand a great deal of composure, attention, tenacity, and courage both on the part of the organizers and the direct participants."

I recall a water training drill involving Petr Klimuk and Miroslav Germashevskiy. A launch was speeding the cosmonauts to the base ship containing an "Okean" simulator.

"What a ride!" rejoiced Germashevskiy at the craft's pitching and rolling.

Klimuk, who had taken part in many training sessions at sea, did not share his exuberance. Today they would be drifting for several hours. He was mentally running through all possible situations and estimating the stress loads which the instructors and the sea would be placing on them.

The cosmonauts were given a medical examination on board ship. After that, donning pressure suits, they took their places in the simulator seats and were strapped in. They signaled they were ready. The crane boom swung the capsule over the edge of the ship. Immediately upon splashdown the sea proceeded to turn and spin it. Klimuk and Germashevskiy were left on their own with the sea.

By the end of the first hour it became uncomfortable in the capsule: the sea had given them a shaking which could not have been reproduced on a vestibular conditioning simulator. A crazy, frantic dance commenced: the cosmonauts were continuously being turn head over heels, over onto the side, and again onto their heads. The heavy rocking and tossing began to make them feel queasy. A great deal of fortitude and courage was required of them in order to fight down the desire to end the proceedings immediately. The sea, as if enraged at their refusal to submit, was proceeding to toss them even more roughly.

"Skipper, the capsule seems to have sprung a leak!" Miroslav suddenly uttered.

Klimuk abruptly turned toward him. Drops of sweat were running down his comrade's pale face. He had taken these drops to be splashes of seawater from outside the capsule. Nevertheless Germashevskiy continued reporting sensations and conditions. The psychologist who was monitoring the session was amazed that even in such extreme conditions the cosmonauts retained enough of a sense of humor to kid one another.

The instructors made this extremely difficult situation even worse: they turned off the capsule and pressure suit ventilation fans. It became stuffy in the capsule.

"Let's take off our pressure suits and put on the sea survival gear," the mission commander ordered.

Assisting each other, the cosmonauts unlaced and proceeded to remove their spacesuits. And this was no easy job: they were sweating, causing the suits to cling to their body. They finally succeeded. Now they could take a short breather. But now a new scenario instruction was given: water was entering the capsule.

"We are putting on our sea survival gear and preparing to abandon ship," reported Klimuk.

But the sea was not calming. It stubbornly sought to crush the crew's will, to prevent them from accomplishing their mission. But the friends refused to surrender. They donned their insulating suits, then the outer suits, retrieved the survival kit, and prepared to leave the capsule.

They opened the hatch; a wave lashed the capsule. The cosmonauts jumped into the swell. The boiling wave crests whipped their faces and crashed over their heads. They swam to each other, opened up the survival kit and pulled out a radio and light signaling devices. They guided the search ship to their location with the radio and lights. The recovery and rescue team plucked the cosmonauts out of the water and brought them on board the recovery ship. The drill was over.

In spite of the difficulty of organizing sea survival training activities, we repeatedly conducted such training. We should like to express heartfelt thanks to naval personnel for their enormous, truly fraternal aid and assistance.

We should note that the volume, content, and time of training sessions can vary, depending on the tasks involved in forthcoming manned missions, orbital inclination, survival kit and special gear on board.

Experience has shown that cosmonaut recovery from the landing site may take 30 hours or more. Therefore cosmonauts must be prepared for an extended, unassisted wait on land and on water.

Unquestionably survival training in the realistic extreme conditions of various climatic-geographic zones involves a certain degree of risk. But we do not shy away from training activities in the altitude chamber, anechoic chamber, weightlessness simulation tank, centrifuge, flying laboratories and, finally, aircraft flights and parachute jumping. After all, they too carry a certain degree of risk. The safety of training activities of all types depends on the degree of preparation of the specialists involved and organization of the training process.

It is advisable to conduct cosmonaut crew training in recovery capsule mock-ups with systems close to those of the actual spacecraft and which continue to function after landing. This increases cosmonaut cohesiveness, teamwork, and volitional toughening. Indeed, a feeling of fellowship and mutual assistance are more vividly manifested in these conditions, and crew members realize that they cannot manage without one another. The process of survival training provides the best test of psychological compatibility between crew members and the ability to adjust personalities and habits, which is especially important on extended manned missions.

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U.S. SPACE WEAPONRY SCHEMES REVIEWED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 42-43

[Article, published under the heading "Abroad," by L. Tkachev: "U.S. Militarist Arrogance"; based on materials published abroad]

[Text] Washington's "Star Fever"

After the USSR and the United States ratified in 1967 a treaty prohibiting the deployment of nuclear weapons in space, most people throughout the world breathed a sigh of relief, believing that this new environment was now unlikely to become a battlefield. But only 15 years have passed since, and on the streets in the cities of Western Europe and the United States passersby are currently being startled by posters publicizing so-called "star wars." During all this time Western strategists and arms experts have been quietly continuing to nurture ideas on utilization of space as a theater of war. Today they are no longer even concealing their ideas. In addition, the Western mass media are aggressively publicizing them.

Just what kind of ideas are these? They are the usual adventuristic ideas, fraught with danger for the future. Pentagon strategists and Reagan's science advisers, for example, are now proposing slightly to modify those same mirrors which at one time were planned to be launched into space in order, utilizing solar energy, to light city streets, farmlands and northern regions, for the purpose of destroying Soviet missiles. In their opinion this system possesses a number of advantages. For example, its largest and most complicated components -- a laser radar -- will be Earth-based, where it can be more easily maintained and defended. This system does not involve the direct deployment of weapons in space, and rapid launch hardware will ensure that it goes into operation when needed. The mirrors can be retargeted by Earth command.

Experts believe that technical realization of this proposal is possible at the end of the 20th-beginning of the 21st century. But the first draft proposals have materialized following the appeal made by the U.S President in March, calling for designing and building space laser systems. One of these schemes would involve 24 orbiting laser platforms in three polar orbital planes, 8 in each. On-board infrared telescopes and tracking and launch system digital computers, 4 seconds from the moment of target identification, would issue a command to

flood the enemy with thermal energy. The firm of TRW contracted to develop a chemical laser for this system. The optical mirror which will focus a laser beam onto the target is being developed by Eastman Kodak, Corning Glass, and Lockheed. The target tracking and guidance system is being developed by Lockheed.

A second laser system being studied by the Pentagon employs nuclear energy. The X rays emitted during a nuclear bomb burst would be focused onto the target. If the target is a missile, it will shatter like glass. A third system bears the name "Beam Weapon" and will emit a beam of atoms to destroy its target, hitting like a bolt of lightning.

Of course all these are merely plans at the present time. Their implementation requires time and new technology, which the United States does not presently possess. But they should not be underestimated. Elevating the development of space weapons to the status of government policy, financing execution of a number of projects and calling for extensive scientific research in this field, the White House is making a resolute move against the balance of power, aimed at establishing military superiority on the Earth by deploying weapon systems in space.

"High Lines"

This is the designation of a project under development in the United States, involving a three-echelon antimissile defense system. As the authors envisage it, the forward-echelon weapons (satellites) would intercept the missiles of the potential adversary during their powered flight phase, the second-echelon weapons (orbital stations carrying beam and laser weapons) would make the intercept in the middle phase, while the third-echelon weapons (ABM launchers) would intercept in the terminal segment of the flight trajectory. The scheme was devised under the direction of retired Lt Gen D. Graham, former Defense Department intelligence director. In the estimate of the scheme's authors, it will ensure interception of 90-95% of enemy missiles.

The magazine AVIATION WEEK AND SPACE TECHNOLOGY contains information on the weapons of the first and third echelons. The magazine notes that satellites carrying missiles to intercept enemy missiles in the powered flight phase were being considered 20 years ago by a number of companies which were working on the "Bambi" project under contract with the Department of Defense to develop future weapons programs. At the time the project was halted at the preliminary planning stage, due to unacceptably high costs and doubtfulness of the project's technical feasibility. Today's proposals are grounded on actual engineering solutions. For example, interceptors can be designed on the basis of antisatellite weapons.

According to the scheme, the first echelon consists of a system of 432 satellites, 108 of which would be positioned over Soviet territory at any given time. They would be placed in 24 orbital planes at 15 degree intervals, with 18 satellites in each. Orbital altitude would be 550 km, inclination 65°. Each satellite would be equipped with a propulsion unit, an infrared homing system, and 40-45 nonnuclear interceptor missiles. Its mass would not exceed 2.5 tons,

and it could be boosted into orbit by an MX rocket, Kwajalein Atoll is considered to be the most favorable site for a launch complex. The total cost of building the system will be 13 billion dollars.

The authors of this scheme believe that it can be implemented in 6 years if system design and construction begin within 3 years. At the same time the magazine expresses certain doubts. The fact is that the maximum number of annual launchings in the United States has not exceeded 74. Implementation of this project alone would require almost 150 launchings annually.

Another version of this project is also being considered: a smaller number of heavier satellites. Alongside certain advantages, however, the alternative system would cost twice as much, and would also require more time to reach operational status.

A second-generation (second echelon) space-based ABM system could be developed in 10-12 years, designed to intercept hostile warheads in the middle phase of their trajectory, in the area of its highest point. It would be designed to intercept targets getting past the first echelon.

A single-seat manned vehicle, dubbed "Spaceplane," would be developed in 6 to 8 years to service and maintain the first and second echelon systems. A proposal has been submitted to the White House, Congress, Department of Defense, State Department, and Arms Control and Disarmament Agency. Whatever peaceful purposes the authors of the project and their Washington patrons claim for the development of space weapon systems, any military expert knows that in these systems there is no boundary line separating weapons into offensive and defensive, while the U.S. military rearmament policy, from a political standpoint, pursues the goal of first-strike capability.

Combat Orbital Station

In the future space will become the principal theater of military operations. The United States is establishing a special branch of the armed forces for conducting military operations in and from space. An orbiting combat station, in stationary orbit and manned by a crew of up to 1,000 men, will be the principal weapons platform for this armed forces branch. According to the prediction, 50 years hence the Pentagon will be operating three of these stations. Containing a nuclear power generating plant and their own supply and maintenance bases located in far space, they will be capable of operating for several years in a self-contained fashion. The journal ASTRONAUTICS AND AERONAUTICS reports on this.

A "space aircraft carrier" will carry on board reconnaissance spacecraft, interceptors, and transport ships. The laser and beam weapons aboard will be capable of destroying not only targets in space but also terrestrial targets, including missiles being launched. Space-based orbiting stations will become the principal element in the military command, control, and communications system. In the author's opinion, combat operations on the Earth will commence after one of the opposing sides gains supremacy in space.

Just who benefits from such a publicity campaign? He who is attempting to escalate the arms race, particularly the big financial magnates and their patrons in the White House. But their actions will not be without response. This was the subject of discussion at a Moscow meeting of 7 socialist countries.

CPSU Central Committee General Secretary Comrade Yu. V. Andropov, in his reply to an appeal by a group of U.S. scientists and civic leaders calling for the banning of weapons in space, noted: "...Recent events indicate that an increasingly growing role is being assigned to utilization of military-application space hardware in U.S. strategic plans, including those announced at the highest levels of U.S. leadership." The Soviet Union, stressed Comrade Yu. V. Andropov, will continue in the future to exert maximum efforts to prevent sinister plans of moving the arms race into space from becoming reality.

Pursuing a policy of strengthening peace and international security, the Soviet Union persistently and consistently demonstrates its readiness and willingness for fruitful, mutually beneficial cooperation and interaction with all countries, including the United States. This is how the world community perceives the results of the conversation between CPSU Central Committee General Secretary Yu. V. Andropov, chairman of the Presidium of the USSR Supreme Soviet, and U.S. senators, and the new, important Soviet initiatives presented by the Soviet leader in the course of this discussion. Prominent government and civic leaders and the mass media in foreign countries emphasize in their numerous commentaries that the decision by the Soviet Union to adopt a unilateral moratorium on the launching of antisatellite weapons is one more specific demonstration of the good will of the USSR and its resolve to strengthen by deeds the peace and security of peoples.

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DEDICATED AIRCRAFT MAINTENANCE SPECIALIST LAUDED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) p 45

[Article, published under the heading "Marching in the Vanguard," by Lt Col A. Finayev: "Devotion to Duty"]

[Text] We met in the maintenance area. Tall and broad-shouldered, Sr WO V. Mikhaylov gave the impression of a sober-minded, self-confident individual.

He spoke proudly about his father and older brother -- decorated veterans of the Great Patriotic War. It was peacetime when he decided to make the military his career. He had served his compulsory term of service as a mechanic in an aviation regiment. He had really liked the strict military discipline and complex equipment. His superiors had taken note of his hard-working nature and follow-through. Therefore they had no vacillations about approving Mikhaylov's request to reenlist for extended service. This had taken place more than 20 years ago.

Neither years nor ordeals had cooled this maintenance specialist's affection for combat equipment or his dedication to his chosen career. At first Mikhaylov had serviced and maintained helicopters. He liked this work.

"It is a fine machine. It can work wonders in the air, and it can land literally on a dime," enthused Viktor Sergeyevich. "You cannot help but have affection for it, and I would not have parted company with helicopters for anything in the world, but once I happened to get talking with a comrade. He spoke so enthusiastically about the fighters which he serviced that I got a hankering to try my hand with servicing and maintenance of supersonic aircraft."

Thus began a difficult time for Mikhaylov. It was necessary for him thoroughly to study the construction of, servicing and maintenance procedures on an unfamiliar aircraft and to adjust to the more rapid rhythm of servicing and maintenance on the missile-armed combat aircraft. As one of the most capable maintenance specialists, Viktor Sergeyevich was assigned to the regimental technical maintenance unit and given an officer's assignment slot -- air-frame and powerplant maintenance group technician. It was here that his professional and organizing abilities were fully revealed.

Once Warrant Officer Mikhaylov noted that the mechanics were slow about performing maintenance procedures, checking a hose on the canopy. Some of them were also failing to employ the proper sequence of installation procedures. This caused Mikhaylov to ponder the situation: what could be done to ensure that the maintenance personnel did not repeat such errors in the future, and how could their job be made easier? He conferred with the group supervisor, Capt Tech Serv N. Konik, and with other experienced aviation personnel. He subsequently suggested that a hose testing device he had designed be adopted. This device is now an indispensable item for mechanics performing maintenance procedures.

Within a span of just a few years this active innovator devised and adopted more than 150 efficiency innovation suggestions. Most of them were aimed at speeding up aircraft servicing and maintenance and at guaranteeing systems reliability. Take, for example, his general-purpose device for measuring landing gear and mudguard clearances. The former device was large and unwieldy. Therefore, in performing the procedure, the maintenance people were forced to take several measurements. Now, thanks to this clever innovator's suggestion, procedure has become much simpler, and the quality of equipment maintenance has improved. Substantial results have also been obtained from adoption of a cart for moving aircraft engines, which Viktor Sergeyevich designed jointly with WO V. Slivinskiy. Formerly at least 10 mechanics were required to move an engine, while now two can do the job.

Recently V. Mikhaylov and V. Slivinskiy adopted still another innovation, the idea for which was picked up at the Exhibit of Achievements of the USSR National Economy: a periscope for inspecting the condition of the vanes on the turbo-cooler which regulates cockpit air temperature. The cooler is not easily accessible. In the technical maintenance unit cooler inspection and preventive maintenance would usually be assigned to the most highly skilled maintenance specialist. Now, using the new device, personnel save both labor and time.

Warrant Officer Mikhaylov is not only an acknowledged innovator but also an aggressive disseminator of scientific and technical knowledge. Jr Sgt Kh. Yarullin, Pvts I. Filipenkov, Yu. Petukhov, and S. Chmyr', as well as other mechanics became active in efficiency innovation work under his influence.

Recently important events took place in the life of this vanguard serviceman. Mikhaylov met his socialist pledges with flying colors and earned his master's proficiency rating. As one of the most experienced maintenance specialists and indoctrinators, he was promoted to the rank of senior warrant officer. Another government decoration was added to those he had received previously -- a For Distinction in Military Service Medal, 2nd Class. His fellow servicemen are learning from this competition right-flanker, and the men of other subunits enthusiastically adopt his know-how.

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FUTURE FIGHTER AIRCRAFT POWERPLANTS DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 11, Nov 83 (signed to press 4 Oct 83) pp 46-47

[Article, published under the heading "Abroad," by Engr-Col V. Fedorov: "For Fighters of the Future"; based on materials published abroad]

[Text] The evolution of aircraft would indicate that one of the determining preconditions for the development of each new generation of fixed-wing combat aircraft and other aircraft is the development of new engines, with substantially improved performance. It is therefore not surprising that reports have recently appeared in the foreign press attesting to intensive efforts being conducted in this area in various countries, particularly the United States. As experts note, of particular interest is the engine to power the future ATF fighter. It is planned to become operational with the U.S. Air Force at the beginning of the 1990's.

According to published preliminary information, this aircraft will cruise at supersonic speed, will be highly maneuverable, have a low detection signature, will have STOL capability, and will carry a heavy combat payload. High requirements are being placed on range. Its combat radius, with 75 percent of its fuel consumed in level flight and 25 percent in air combat, is 555 km at a supersonic cruising speed of Mach 1.8, and 925 km at optimal subsonic cruising speed.

Experts believe that in order to achieve these performance figures, a fighter should be powered by a turbofan engine with afterburner, which is relatively lighter (by 25 percent) than the current-production F100, more economical (by 25-40 percent) and with greater nonafterburner thrust at supersonic speed. A 20 percent increase in engine economy increases combat radius by 25 percent, while a 20 percent decrease in weight per horsepower extends range by 13 percent. Increased thrust, decreased weight per horsepower, and improvement in engine economy can be obtained primarily by increasing the efficiency of its thermodynamic cycle, which is attained by higher gas temperatures at turbine inlet T_T^* and overall degree of air pressure boost in the compressor $\pi_{K\Sigma}^*$.

An increase in thrust-to-weight ratio with an increased T_T^* will make it possible to obtain the desired parameters with less air consumption and, consequently, with smaller engine geometric size and weight. An increase in thrust-to-weight

ratio also appreciably decreases specific fuel consumption with afterburning, which is also achieved by lowering the bypass ratio (m).

One important developmental direction in the field of aircraft powerplant engineering today is the development of a variable-process engine (TRDI). Such an engine has structural components (controllable nozzle box assemblies, controls for varying rate of ducted air flow) to redistribute energy between ducted flows and optimization of engine operating cycle parameters for different airspeeds. A TRDI can involve variable bypass ratio, operating as a turbofan or turbojet, with or without afterburning.

A foreign company is presently testing such an experimental TRDI. Successful development of engine components will make it possible to use them in a future engine powering a future fighter, for the purpose of improving engine economy at subsonic and supersonic speeds. An engine can be designed, for example, to operate with a bypass ratio of 0.7 at Mach 0.8 and with a ratio of 0.25 at Mach 1.8. Experts believe that an increase in design complexity would lead to a certain increase in weight per horsepower.

Design engineering methods aimed at reducing the weight of individual engine components play an important role in accomplishing the task of reducing engine weight per horsepower.

There has already been noted a certain trend, consisting in employment of more sophisticated and aerodynamically-loaded compressor and turbine stages, which will make it possible to reduce the number of stages. Alongside decreasing unit weight, another important requirement on the engine of the future will be met -- a significant simplification of design, cutting the total number of parts in half, and a 30 percent reduction in "life cycle" cost. Figure 1 depicts the trend toward an increase in the compression ratio with a decrease in the number of compressor stages and a relative increase in heat drop in the high-pressure turbine. This is demonstrated in the example of engines of different generations, particularly those powering modern U.S. fighters.

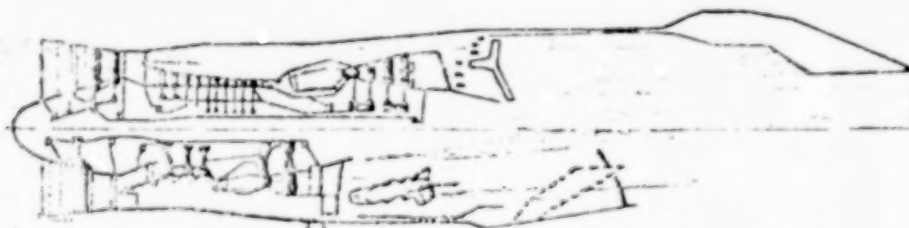


Figure 1. Comparison of Configurations of a Contemporary (Upper Half) and Future Fighter Engine.

Experts plan to utilize even more heavily-loaded elements in future engines. The configuration of a future engine is distinguished by a single-stage fan and a three-stage high-pressure compressor with wide-chord (small aspect ratio) blades and single-stage high and low-pressure turbines.

Alongside development of a three-stage high-pressure compressor, work is in progress on developing a high-pressure compressor with a somewhat larger number of stages. One foreign company, for example, is studying a five-stage high-pressure compressor. With this compressor they have confirmed the possibility of boosting efficiency 4 percent over the 10-stage high-pressure compressor in the F100 engine. It is believed that based on employment of heavily-loaded fan, compressor, and turbine stages, the future engine will consist of a smaller number of principal parts.

Presently being used to achieve the desired turbine inlet gas temperature are blade designs employing convective cooling through interior channels (cast or with the aid of an inserted deflector) and protective film cooling on a surface washed by flow of gases. The relative degree of cooling value reaches 0.4 and more with such blades. So-called superalloys, which permit extended blade operation at temperatures of 950-970°C, are widely used in blade manufacture. With traditional casting methods this material has a polycrystalline structure with random arrangement of grains, the boundaries of which are a potential structural weak point. Foreign experts believe that the temperature capabilities of blades manufactured of such materials can be increased by 40°C by accomplishing directional crystallization in the blade casting process. An additional increase in strength properties by 30°C can be achieved by obtaining a single-crystal structure. This can be achieved by introducing a crystallization selector into the blade casting mold, which triggers the growth of just one grain in the desired direction. Thus, taking into consideration high-temperature treatment of single-crystal blades, which boosts their operating temperature by an average of 15°C, overall increase in the strength properties of cast blades can be characterized by a temperature interval of 125°C. Their operating temperature will reach 1075-1095°C correspondingly. Work is already in progress abroad in this direction.

Another way to go is the development of a new high-temperature composite material. A special manufacturing process has been developed for this purpose. First a tungsten-strengthened thin wire is plated with a matrix of a nickel-base alloy. The plated wire is then cut into pieces, the length of which corresponds to the size of the piece being fabricated, the pieces are assembled into parallel bunches, placed in securing tubes and, together with their contents, by the isostatic molding method (uniform compression on all sides), the process taking place in a vacuum, are joined into a single piece of the required shape.

Extensive use of ceramic materials is one of the new trends in the investigation of materials used in the manufacture of turbine blades. The advantage of ceramic materials lies in the fact that they maintain a high level of strength up to a temperature of 1330°C. But ceramic materials are brittle, are poorly resistant to tensile stresses, and are sensitive to minor defects. Initial results have already been obtained. One foreign company, for example, tested small ceramic turbine blades in a 1000 horsepower turboprop engine. The blades successfully passed a thermal shock test.

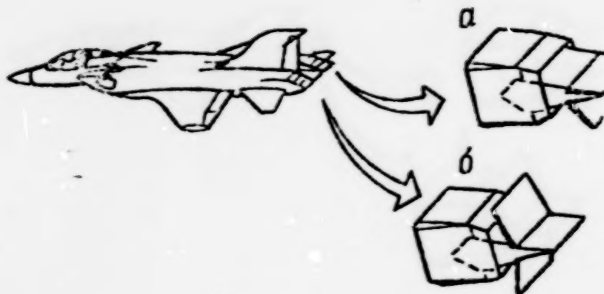


Figure 2. One of the Possible Types of Flat Nozzles: a -- thrust vector control; b -- thrust reversing

Extensive adoption of a digital electronic powerplant control system is an important factor increasing the reliability of the aircraft powerplant of the future, as well as reducing its weight and "life cycle" cost. High accuracy of measurement of parameters, computations and control processes with the aid of an airborne digital computer make it possible to transition to promising engine control mechanisms, bringing engine operating characteristics maximally close to the redline point without exceeding operating limits across the entire range of flight conditions.

Employment of nonaxisymmetric jet nozzles is viewed as one means of meeting requirements on the engine of the future as regards reducing thermal signature. Studies have indicated that a two-dimensional rectangular cross-section flat nozzle (Figure 2) ensures a minimal angle of visibility of hot engine parts and a narrowing of the exhaust jet core, and consequently decreased infrared radiation.

In developing a new powerplant, foreign experts are also concerned with a high degree of engine combat survivability: particularly diminishing an engine's vulnerability to damage by projectile and missile warhead fragments by reducing the size and number of engine parts and by employing a turbofan engine design, which decreases probability of ejection of a stream of hot gas into the fuselage engine space in case of combustion chamber wall failure. Another configuration involves installation of two engines separated by a protective firewall partition. A demonstration engine is to be built in the next 2 years, for the purpose of validating the design configuration and performance characteristics of a subsequent commercial version, as a first stage in the development of a new U.S. engine.

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